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ABSTRACT

This revision of a 1965 publication lists approximately 700 titles on mathematics for four-year colleges. The titles are grouped by mathematical content; included also are categories for general, foundations, journals, series, films, and foreign-language references. The purposes of the list are to provide: (1) students with introductory, collateral, and supplementary reading; (2) faculty with relevant reference material; and (3) general readers with interesting mathematical reading. The list can be used as a guide in updating and extending library holdings. (MS)

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BASIC LIBRARY LIST

for

FOUR-YEAR COLLEGES

Second edition 1976

Committee on the Undergraduate Program in Mathematics

SE 023 080

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PREFACE

The primary objective of the Mathematical Association of America is to promote the interests of mathematics in America, especially at the collegiate level. This is accomplished in a variety of ways, one of which is to provide guidance and assistance to two-year and four-year colleges in improving the quality of undergraduate instruction. Starting in 1960 a series of grants from the National Science Foundation enabled the MAA through its Committee on the Undergraduate Program in Mathematics, to undertake a sustained and systematic effort to develop information and advice concerning the content, methods, and problems of undergraduate mathematics.

One of the most favorably received projects of CUPM was the publication in 1965 of its Basic Library List of books and journals that comprise a nucleus of library holdings in mathematics to serve the essential needs of students and faculty in four-year colleges. An analogous list was published in 1971 to meet the special needs of two-year colleges.

Rapid growth in book publication and the development of new emphases within the undergraduate mathematics curriculum soon caused the Basic Library List to become out of date, and CUPM assigned a high priority to a proposal to revise the four-year college list. Late in 1974 the NSF authorized funds to (a) revise the Basic Library List and (b) propose means by which the MAA might continue to update the lists periodically.

A small committee, formed to carry out this project, began its work by screening approximately 7000 Telegraphic Reviews that appeared in the American Mathematical Monthly between January 1964 and December 1974. Next the committee met with a number of the TR reviewers to prepare lists that combined pre- and post-1964 titles in various subject areas. A tentative list for each subject area was then sent to a consultant who was especially familiar with the literature of that area as it pertains to undergraduate education in mathematics. The committee then reviewed the reports of the consultants to produce the final list. At each stage of this process a concerted effort was made to reduce the list to manageably small size. As a consequence many books of merit (including some old favorites) had to be omitted, and several equally attractive subjects had to be combined into one group from which one book is to be selected. Undoubtedly some excellent books escaped notice, in spite of efforts to conduct a comprehensive search for books that seem to be centrally important in a collection of mathematics books for a four-year college library.

The intended purposes of this revised list of books and other library resources are the same as those of the 1965 list:

1. To provide the students with introductory material in various fields of mathematics that might not be part of

the curriculum, with reading material that is collateral to the curriculum, and with supplementary reading at a level beyond the usual undergraduate courses.

2. To provide faculty with reference material that is relevant to their teaching and their mathematical interests.

3. To provide general readers with interesting reading in and about mathematics.

The list is intended to be flexible, though minimal. Approximately 700 separate titles are given, but books that are roughly comparable are grouped together with the recommendation that the library contain at least one or two from each group. Approximately 300 titles meet these recommendations. A library that has resources to acquire more than the minimal recommendations can use the list to strengthen its holdings, especially in those areas that are of special interest to students and faculty in that institution.

In spite of conscious efforts to keep the revised list small, it is substantially larger than the 1965 list of 300 books from which 170 were to be selected. Such increases reflect the development of the subject and its literature over the past decade, as well as changes of emphasis in the undergraduate mathematics curriculum. In this connection we mention, in particular, numerical methods, computation, combinatorics, and applications of mathematics to a variety of other subjects. It is essential, we feel, that library acquisitions respond promptly to important trends in subject matter emphasis, and for this reason the 1975 list might appear to include a disproportionate number of titles in recently developing areas of mathematical literature.

Next we offer a few suggestions about the use of this list, which is intended as guidance for library holdings rather than prescription of new acquisitions. Many libraries will already have accumulated books that essentially meet the minimal expectation of the 1965 list. The revised list can be used simply to update subject areas in which the present holdings are currently adequate and to extend significantly the coverage in some of the newer subject areas. The mathematics faculty ought to be able and willing to assist librarians in identifying subjects in which present holdings are deficient and in establishing priorities for the expenditure of funds allocated for new purchases. The most important advice we can offer is that when current library holdings provide a basic coverage of collegiate mathematics, further acquisitions should be used to support the special objectives of the institution as indicated by the needs and interests of the students and faculty.

Some books in the 1965 list were not included in the revised list because they are known to be out of print while a few such books were retained in the list even though they appear to be currently out of print. If a library already contains books that are out of print but are comparable to new listings, limited funds for

new acquisitions should first be used to extend library holdings to subjects that are not presently covered adequately.

In a list of this type it is impossible to avoid the personal preference of committee members, reviewers, and consultants. If any person knows that a particular book is better suited for library acquisition than similar books in this list, he or she should not hesitate to recommend its purchase.

In the revised list the books are arranged under 16 general subject headings, each of which is identified by a capital letter. Each subdivision within one heading is assigned a number followed by a decimal point. Each suggested selection within a subdivision is assigned a number to the right of the decimal point, and when one or two choices are suggested from among several alternative books, each such title is distinguished by a lower case letter. Thus J2.1d indicates the heading J (topology), subdivision 2 (general), selection 1 in that subdivision, and title d that might be chosen from several titles grouped together. Books that are grouped together do not necessarily cover the same material nor are they necessarily interchangeable in any particular way.

Members of the committee wish to express appreciation to all persons who gave valuable and essential support to this project--consultants, reviewers, and individuals who volunteered information and advice. We record with sadness the death of Professor Dan E. Christie, a co-author of the 1965 Basic Library List who also had agreed to be a consultant for this revision. Just prior to his death on July 17, 1975 Dan Christie had completed a manuscript for an introductory textbook on topology to be published by Macmillan. We trust it will become available for possible inclusion in the next version of this list.

Future editions and supplements of Library Lists will be issued from time to time by the MAA. Readers are encouraged to submit suggestions for improving the lists. Please send your comments to MAA Special Projects Office, Department of Mathematics, California State University, Hayward, CA 94542.

A. GENERAL

A1 Readings

A1.1 (At least one of the following)

a. Aleksandrov, A. D.; Kolmogorov, A. N.; Lavrent'ev, M. A., eds. Mathematics, Its Content, Methods, and Meaning, 3 vols. Cambridge, MA, MIT Press, 1969.

b. Behnke, H., et al., eds. Fundamentals of Mathematics, 3 vols., trans. by S. H. Gould. Cambridge, MA, MIT Press, 1974.

A1.2 (At least one of the following)

a. The Mathematical Sciences. A Collection of Essays. Ed: National Research Committee on Support of Research in the Mathematical Sciences (COSRIMS), with the collaboration of George A. W. Boehm. Cambridge, MA, MIT Press, 1969.

b. Saaty, Thomas L. and Weyl, F. Joachim, eds. The Uses and Spirit of the Mathematical Sciences. New York, McGraw-Hill Book Company, 1969.

c. Scientific American Editors. Mathematics in the Modern World. San Francisco, W. H. Freeman and Company, 1968.

A1.3 (At least one of the following)

a. Kline, Morris. Mathematics in Western Culture. New York, Oxford University Press, 1964.

b. Resnikoff, H. L. and Wells, R. O., Jr. Mathematics in Civilization: Geometry and Calculation as Keystones of Culture. New York, Holt, Rinehart and Winston, 1973.

A1.4 Honsberger, Ross. Mathematical Gems from Elementary Combinatorics, Number Theory, and Geometry. Washington, DC, Mathematical Association of America, 1974.

A1.5 (At least one of the following)

a. Courant, R. and Robbins, H. What is Mathematics? New York, Oxford University Press, 1941.

b. Steinhaus, H. Mathematical Snapshots, 2nd ed., rev. and enl. Oxford University Press, 1969.

c. Rademacher, Hans and Toeplitz, Otto. The Enjoyment of Mathematics, trans. by H. Zuckerman. Princeton, NJ, Princeton University Press, 1957.

A1.6 (At least one of the following)

a. Pólya, George. Mathematics and Plausible Reasoning, vols. I and II. Princeton, NJ, Princeton University Press, vol. I, 1954; vol. II, rev. ed., 1969.

b. Pólya, George. Mathematical Discovery, 2 vols. New York, John Wiley and Sons, 1962.

A1.7 Newman, James R. The World of Mathematics, 4 vols. New York, Simon and Schuster, 1956-1960.

A1.8 Saaty, Thomas L., ed. Lectures on Modern Mathematics, 3 vols. New York, John Wiley and Sons, 1963-1965.

A1.9 Sawyer, W. W. Introducing Mathematics, 4 vols. London, Penguin Books, vol. 1, 1964; vol. 2, in preparation; vol. 3, 1970; vol. 4, 1969.

A1.10 Hadamard, Jacques. Psychology of Invention in the Mathematical Field. New York, Dover Publications, 1945.

A1.11 Hardy, G. H. A Mathematician's Apology, rev. ed. New York, Cambridge University Press, 1969.

A1.12 Wilder, Raymond L. Evolution of Mathematical Concepts. New York, Halsted Press, 1974.

A2 Problems and Recreation

A2.1 (At least one of the following)

a. Ball, W. W. Rouse and Coxeter, H. S. Mathematical Recreations and Essays. Buffalo, NY, University of Toronto Press, 1974.

b. Kraitchik, Maurice. Mathematical Recreations, 2nd ed. New York, Dover Publications, 1953.

A2.2 (At least one of the following)

a. Pólya, George and Kilpatrick, Jeremy. The Stanford Mathematics Problem Book with Hints and Solutions. New York, Teachers College Press, 1974.

b. Shlarsky, D. O.; Chentzov, N. N.; Yaglom, I. M. The USSR Olympiad Problem Book, ed. by I. Sussuman, trans. by J. Maykovich. San Francisco, W. H. Freeman and Company, 1962.

c. Steinhaus, H. One Hundred Problems in Elementary Mathematics. New York, Basic Books, 1964. (Out of Print)

A3 History

A3.1 Birkhoff, Garrett, ed. A Source Book in Classical Analysis. Cambridge, MA, Harvard University Press, 1973.

A3.2 Boyer, Carl B. A History of Mathematics. New York, John Wiley and Sons, 1968.

A3.3 Dantzig, Tobias. Number, the Language of Science, 4th ed. New York, Free Press, 1967.

A3.4 Kline, Morris. Mathematical Thought from Ancient to Modern Times. New York, Oxford University Press, 1972.

A3.5 Kramer, Edna E. The Nature and Growth of Modern Mathematics, 2 vols. New York, Fawcett World Library, 1974.

A3.6 May, K. O. Bibliography and Research Manual of the History of Mathematics. Buffalo, NY, University of Toronto Press, 1973.

A3.7 Neugebauer, O. The Exact Sciences in Antiquity, 2nd ed. Providence, RI, Brown University Press, 1970.

A3.8 Struik, D. J., ed. A Source Book in Mathematics, 1200-1800. Cambridge, MA, Harvard University Press, 1969.

A3.9 van der Waerden, Bartel L. Science Awakening, trans. by A. Dresden. New York, Oxford University Press, 1961.

A3.10 Zaslavsky, Claudia. Africa Counts: Number and Pattern in African Culture. Boston, Prindle, Weber and Schmidt, 1973.

A4 Biography

There are many good biographies and every library should have a selection. The following are samples of books of this type. For a more complete listing see A3.6.

A4.1 Bell, Eric T. Men of Mathematics. New York, Simon and Schuster, 1937.

A4.2 Hardy, G. H. Ramanujan. New York, Chelsea Publishing Company, 1968.

A4.3 Ore, Oystein. Niels Henrik Abel: Mathematician Extraordinary. New York, Chelsea Publishing Company, 1974.

A4.4 Reid, Constance. Hilbert. New York, Springer-Verlag New York, 1970.

A4.5 Wiener, Norbert. I Am a Mathematician. Cambridge, MA, MIT Press, 1964.

A5 Education

A5.1 History (At least one of the following)

a. Bidwell, James K. and Clason, Robert G., eds. Readings in the History of Mathematics Education. Reston, VA, National Council of Teachers of Mathematics, 1970.

b. Jones, Phillip S., ed. A History of Mathematics Education in the United States and Canada, 32nd Yearbook. Reston, VA, National Council of Teachers of Mathematics, 1970.

A5.2 Teaching Elementary School Mathematics (At least one of the following)

a. Kennedy, Leonard M. Guiding Children to Mathematical Discovery, 2nd ed. Belmont, CA, Wadsworth Publishing Company, 1975.

b. Underhill, Robert. Methods of Teaching Elementary School Mathematics, new ed. Columbus, OH, Charles E. Merrill Publishing Company, 1975.

c. Williams, Elizabeth and Shuard, Hilary. Elementary Mathematics Today. Reading, MA, Addison-Wesley Publishing Company, 1972.

A5.3 Topics in Elementary School Mathematics

A5.3 National Council of Teachers of Mathematics. Topics in Mathematics for Elementary School Teachers, 29th Yearbook and More Topics in Mathematics for Elementary School Teachers, 30th Yearbook. Reston, VA, National Council of Teachers of Mathematics, 1966, 1969.

A5.4 Geometry for Elementary Teachers (At least one of the following)

a. Konkle, Gail S. Shapes and Perceptions: An Intuitive Approach to Geometry. Boston, Prindle, Weber and Schmidt, 1974.

b. Haag, Vincent H.; Hardgrove, Clarence E.; Hill, Shirley A. Elementary Geometry. Reading, MA, Addison-Wesley Publishing Company, 1970.

A5.5 Arithmetic for Elementary Teachers (At least one of the following)

a. Peterson, John A. and Hashisaki, Joseph. Theory of Arithmetic, 3rd ed. New York, John Wiley and Sons, 1971.

b. Wolf, Frank L. Number Systems and Their Uses. Lexington, MA, Xerox College Publishing, 1971. (Out of Print)

A5.6 Axiomatics and Problem Solving (Both of the following)

a. Begle, E. G., ed. The Role of Axiomatics and Problem Solving in Mathematics. Lexington, MA, Ginn and Company, 1966. (Out of Print)

b. Pólya, George. Mathematical Discovery, 2 vols. New York, 1962.

A5.7 Readings in Secondary School Mathematics (At least one of the following)

a. Aichele, Douglas B. and Reys, Robert F., eds. Readings in Secondary School Mathematics. Boston, Prindle, Weber and Schmidt, 1971.

b. Rising, Gerald R. and Wiesen, Richard. Mathematics in the Secondary School Classroom: Readings. New York, Thomas Y. Crowell Company, 1972.

A5.8 School Mathematics Curriculum (At least one of the following)

a. Davis, Robert B. The Changing Curriculum: Mathematics. Washington, DC, National Education Association, 1967. (Out of Print)

b. Howson, A. G., ed. Developments in Mathematical Education: Proceedings of the Second International Congress on Mathematical Education. New York, Cambridge University Press, 1973.

c. National Council of Teachers of Mathematics. Geometry in the Mathematics Curriculum, 36th Yearbook. Reston, VA, National Council of Teachers of Mathematics, 1973.

A5.9 Teaching Secondary School Mathematics (At least one of the following)

a. Crosswhite, F. Joe; Higgins, Jon L.; Osborne, Alan R.; Shumway, Richard J. Teaching Mathematics: Psychological Foundations. Worthington, OH, Charles A. Jones, 1973.

b. Johnson, Donovan A. and Rising, Gerald R. Guidelines for Teaching Mathematics, 2nd ed. Belmont, CA, Wadsworth Publishing Company, 1972.

c. National Council of Teachers of Mathematics. The Teaching of Secondary School Mathematics, 33rd Yearbook. Reston, VA, National Council of Teachers of Mathematics, 1970.

A5.10 Undergraduate Curriculum Recommendations

A5.10 Committee on the Undergraduate Program in Mathematics. A Compendium of CUPM Recommendations, 2 vols. Washington, DC, Mathematical Association of America, 1975.

A6 Reference Materials

A6.1 James, Glenn and James, Robert C., eds. Mathematical Dictionary, 4th ed. New York, Van Nostrand Reinhold Company, 1976.

A6.2 Pemberton, John E. How to Find Out in Mathematics, 2nd rev. ed. Elmsford, NY, Pergamon Press, 1970.

A6.3 Gaffney, Matthew P. and Steen, Lynn Arthur. Annotated Bibliography of Expository Writing in the Mathematical Sciences. Washington, DC, Mathematical Association of America, 1976.

A6.4 (At least one of the following)

a. Burington, Richard S. Handbook of Mathematical Tables and Formulas, 5th ed. New York, McGraw-Hill Book Company, 1973.

b. Chemical Rubber Company. Standard Mathematical Tables. Cleveland, OH, Chemical Rubber Company. (Any recent edition) (Includes item 6.4b below)

A6.5 (At least one of the following)

a. Burington, Richard S. and May, Donald C., Jr. Handbook of Probability and Statistics with Tables, 2nd ed. New

b. Chemical Rubber Company. Handbook of Tables for Probability and Statistics. Cleveland, OH, Chemical Rubber Company. (Any recent edition)

c. Rohlf, F. James and Sokal, Robert R. Statistical Tables. San Francisco, W. H. Freeman and Company, 1969.

A6.6 National Bureau of Standards, U. S. Department of Commerce, Applied Mathematics, Series 55. Handbook of Mathematical Functions, edited by M. Abramowitz and I. A. Stegun. Washington, DC, U. S. Government Printing Office, 1964.

A6.7 Gradshteyn, I. S. and Ryzhik, I. M. Tables of Integrals, Series, and Products, 4th ed. New York, Academic Press, 1966.

A6.8 Sloane, N. J. A. A Handbook of Integer Sequences. New York, Academic Press, 1973.

B. FOUNDATIONS

B1 General

B1.1 Wilder, Raymond L. Introduction to the Foundations of Mathematics, 2nd ed. New York, John Wiley and Sons, 1965. (Out of Print)

B1.2 (At least one of the following)

a. Hatcher, William S. Foundations of Mathematics. Philadelphia, W. B. Saunders Company, 1968. (Out of Print)

b. Kneebone, G. T. Mathematical Logic and the Foundations of Mathematics. New York, Van Nostrand Reinhold Company, 1963.

B1.3 Davis, Martin, ed. The Undecidable: Basic Papers on Undecidable Propositions, Unsolvable Problems and Computable Functions. New York, Raven Press, 1965. (Out of Print)

B1.4 Baum, Robert J. Philosophy and Mathematics: From Plato to the Present. San Francisco, Freeman, Cooper and Company, 1974.

B1.5 Van Heijenoort, Jean, ed. From Frege to Gödel: A Source Book in Mathematical Logic, 1879-1931. Cambridge, MA, Harvard University Press, 1967.

B1.6 Benacerraf, Paul and Putnam, Hilary. Philosophy of Mathematics: Selected Readings. Englewood Cliffs, NJ, Prentice-Hall, 1964. (Out of Print)

B2 Logic

B2.1 Introductory (At least one of the following)

a. Copi, Irving Marmer. Symbolic Logic, 4th ed. New York, Macmillan Publishing Company, 1973.

b. Kalish, Donald and Montague, Richard. Logic: Techniques of Formal Reasoning. New York, Harcourt Brace Jovanovich, 1964.

c. Mendelson, Elliott. Introduction to Mathematical Logic. New York, Van Nostrand Reinhold Company, 1964.

d. Quine, Willard Van Orman. Methods of Logic, 3rd ed. New York, Holt, Rinehart and Winston, 1972.

e. Suppes, Patrick C. Introduction to Logic New York, Van Nostrand Reinhold Company, 1957.

f. Tarski, Alfred. Introduction to Logic and to the Methodology of Deductive Sciences, 3rd ed. New York, Oxford University Press, 1965.

B2.2 Advanced (At least one of the following)

a. Enderton, H. B. A Mathematical Introduction to Logic. New York, Academic Press, 1972.

b. Kleene, Stephen Cole. Mathematical Logic. New York, John Wiley and Sons, 1967.

c. Rogers, Robert. Mathematical Logic and Formalized Theories. New York, North-Holland Publishing Company, 1971.

d. Schoenfield, Joseph. Mathematical Logic. Reading, MA, Addison-Wesley Publishing Company, 1967.

e. Smullyan, Raymond M. First-Order Logic. New York, Springer-Verlag New York, 1968.

B2.3 (At least one of the following)

a. Crossley, J. N., et al. What is Mathematical Logic? New York, Oxford University Press, 1972.

b. Nagel, Ernest and Newman, James R. Gödel's Proof. New York, New York University Press, 1958.

B3 Set Theory

B3.1 (At least one of the following)

a. Halmos, Paul R. Naive Set Theory. New York, Springer-Verlag New York, 1974.

b. Quine, Willard Van Orman. Set Theory and Its Logic, rev. ed. Cambridge, MA, Harvard University Press, 1969.

c. Stoll, Robert R. Sets, Logic and Axiomatic Theories, 2nd ed. San Francisco, W. H. Freeman and Company, 1974.

B3.2 (At least one of the following)

a. Fraenkel, Abraham A.; Bar-Hillel, Yehoshra; Levy, Azriel. Foundations of Set Theory, 2nd rev. ed. Studies in Logic and Foundations of Mathematics, vol. 67. Atlantic Highlands, NJ, Humanities Press, 1973.

b. Krivine, Jean-Louis. Introduction to Axiomatic Set Theory. Boston, D. Reidel Publishing Company, 1974.

c. Suppes, Patrick C. Axiomatic Set Theory. New York, Dover Publications, 1972.

B3.3 Rosser, J. Barkley. Simplified Independence Proofs. Models of Set Theory. New York, Academic Press, 1969.

B4 Non-standard Analysis

The first is less advanced than the second.

B4.1 Machover, M. and Hirschfeld, J. Lectures on Non-standard Analysis. New York, Springer-Verlag New York, 1967.

B4.2 Robinson, A. Non-standard Analysis. New York, North-Holland Publishing Company, 1966.

B5 Constructive Methods, Recursive Functions

B5.1 Bishop, Errett. Foundations of Constructive Analysis. New York, McGraw-Hill Book Company, 1967. (Out of Print)

B5.2 (At least one of the following)

a. Davis, Martin. Computability and Unsolvability. New York, McGraw-Hill Book Company, 1958.

b. Rogers, Hartley. Theory of Recursive Functions and Effective Computability. New York, McGraw-Hill Book Company, 1967.

B5.3 (At least one of the following)

a. Boolos, G. S. and Jeffrey, R. C. Computability and Logic. New York, Cambridge University Press, 1974.

b. Yasuhara, Ann. Recursive Function Theory and Logic. New York, Academic Press, 1971.

C. COMBINATORIAL MATHEMATICS
See also A1.4, N8 and P5

C1 Finite Mathematics

C1.1 Kemeny, John G.; Snell, J. Laurie; Thompson, Gerald L. Introduction to Finite Mathematics, 3rd ed. Englewood Cliffs, NJ, Prentice-Hall, 1974.

C1.2 (At least one of the following)

a. Goodman, A. W. and Ratti, J. S. Finite Mathematics with Applications, 2nd ed. New York, Macmillan Publishing Company, 1974.

b. Malkevitch, Joseph and Meyer, Walter. Graphs, Models, and Finite Mathematics. Englewood Cliffs, NJ, 1974.

c. Marcus, Marvin. A Survey of Finite Mathematics. Boston, Houghton Mifflin Company, 1969.

d. Owen, Guillermo. Finite Mathematics for the Social and Management Sciences. Philadelphia, W. B. Saunders Company, 1970.

C2 Combinatorics

C2.1 Berman, Gerald and Fryer, K. D. Introduction to Combinatorics. New York, Academic Press, 1972.

C2.2 Liu, C. L. Introduction to Applied Combinatorial Mathematics. New York, McGraw-Hill Book Company, 1968.

C2.3 Elementary (At least one of the following)

a. Anderson, Ian. A First Course in Combinatorial Mathematics. New York, Oxford University Press, 1974.

b. Vilenkin, N. Ya. Combinatorics, trans. by A. Shenitzer and S. Shenitzer. New York, Academic Press, 1971.

C2.4 Intermediate (At least one of the following)

a. Berge, C. Principles of Combinatorics. (Mathematics in Science and Engineering, vol. 72) New York, Academic Press, 1971.

b. Hall, Marshall, Jr. Combinatorial Theory. New York, John Wiley and Sons, 1975.

c. Riordan, John. An Introduction to Combinatorial Analysis. New York, John Wiley and Sons, 1958.

d. Ryser, H. J. Combinatorial Mathematics. Carus Monograph No. 14. Washington, DC, Mathematical Association of America, 1963.

C2.5 Beckenbach, E. F., ed. Applied Combinatorial Mathematics. New York, John Wiley and Sons, 1964.

C3 Graph Theory

C3.1 Elementary (At least one of the following)

a. Dynkin, E. B. and Uspenskii, V. A. Multicolor Problems. Translated and adapted from the first Russian edition by Norman D. Whaland and Robert B. Brown. Lexington, MA, D. C. Heath and Company, 1963.

b. Ore, Oystein. Graphs and Their Uses. New Mathematical Library. Washington, DC, Mathematical Association of America, 1963.

Intermediate

C3.2 Behzad, Mehdi and Chartrand, Gary. Introduction to the Theory of Graphs. Boston, Allyn and Bacon, 1971. (Out of Print)

C3.3 Wilson, Robin. Introductory Graph Theory. New York, Academic Press, 1972.

C3.4 Advanced (At least one of the following)

a. Berge, Claude. Graphs and Hypergraphs. Translated by Edward Minieka. New York, North-Holland Publishing Company, 1973.

b. Harary, Frank. Graph Theory. Reading, MA, Addison-Wesley Publishing Company, 1969.

C3.5 Applications (At least one of the following)

a. Avondo-Bodino, G. Economic Applications of the Theory of Graphs. New York, Gordon and Breach Science Publishers, 1962.

b. Busacker, Robert G. and Saaty, Thomas L. Finite Graphs and Networks: An Introduction with Applications. New York, McGraw-Hill Book Company, 1965.

c. Johnson, David E. and Johnson, Johnny P. Graph Theory: With Engineering Applications. New York, Ronald Press Company, 1972.

C4 Lattices

C4.1 (At least one of the following; the first book is elementary and the second is advanced)

a. Donnellan, Thomas. Lattice Theory. Elmsford, NY, Pergamon Press, 1968.

b. Crawley, Peter and Dilworth, Robert P. Algebraic Theory of Lattices. Englewood Cliffs, NJ, Prentice-Hall, 1973.

D. LINEAR ALGEBRA
See also G3.5, I8.1, I10, M5 and O2.6

D1 Elementary

D1.1 Vector space emphasis (At least one of the following)

a. Curtis, Charles W. Linear Algebra: An Introductory Approach, 3rd ed. Boston, Allyn and Bacon, 1974.

b. Finkbeiner, Daniel T. Elements of Linear Algebra. San Francisco, W. H. Freeman and Company, 1972.

c. Kolman, Bernard. Elementary Linear Algebra. New York, Macmillan Publishing Company, 1970.

d. Nering, Evar D. Elementary Linear Algebra. Philadelphia, W. B. Saunders Company, 1974.

e. Shields, Paul C. Elementary Linear Algebra, 2nd ed. New York, Worth Publishers, 1973.

D1.2 Computational emphasis (At least one of the following)

a. Davis, Philip J. The Mathematics of Matrices. A First Book of Matrix Theory and Linear Algebra, 2nd ed. New York, John Wiley and Sons, 1973.

b. Gewirtz, Allan; Sitomer, Harry; Tucker, A. W. Constructive Linear Algebra. Englewood Cliffs, NJ, Prentice-Hall 1974.

c. Steinberg, David I. Computational Matrix Algebra. New York, McGraw-Hill Book Company, 1974.

d. Williams, Gareth. Computational Linear Algebra with Models. Boston, Allyn and Bacon, 1975.

D1.3 Emphasis on Applications (At least one of the following)

a. Fletcher, T. J. Linear Algebra Through Its Applications. New York, Van Nostrand Reinhold Company, 1973.

b. Noble, Ben. Applied Linear Algebra. Englewood Cliffs, NJ, Prentice-Hall, 1969.

c. Sawyer, W. W. An Engineering Approach to Linear Algebra. New York, Cambridge University Press, 1972.

D2 Intermediate

D2.1 (At least one of the following)

a. Finkbeiner, Daniel T. Introduction to Matrices and Linear Transformations, 2nd ed. San Francisco, W. H. Freeman and Company, 1966. (Out of Print)

b. Nering, Evar D. Linear Algebra and Matrix Theory, 2nd ed. New York, John Wiley and Sons, 1970.

D2.2 (At least one of the following)

a. Franklin, J. N. Matrix Theory. Englewood Cliffs, NJ, Prentice-Hall, 1968.

b. Hohn, Franz. Elementary Matrix Algebra, 3rd ed. New York, Macmillan Publishing Company, 1973.

c. Marcus, M. and Minc, H. Survey of Matrix Theory and Matrix Inequalities. Boston, Allyn and Bacon, 1964. (Out of Print)

D3 Advanced

D3.1 (At least one of the following)

a. Halmos, Paul R. Finite-dimensional Vector Spaces, 2nd ed. New York, Springer-Verlag New York, 1968.

b. Hoffman, Kenneth and Kunze, Ray. Linear Algebra, 2nd ed. Englewood Cliffs, NJ, Prentice-Hall, 1971.

c. Shilov, G. E. Linear Algebra, trans. by R. A. Silverman. Englewood Cliffs, NJ, Prentice-Hall, 1971.

D3.2 (At least one of the following)

a. Gantmacher, Felix. Matrix Theory, vols. I, II. New York, Chelsea Publishing Company, 1959.

b. Varga, R. S. Matrix Iterative Analysis. Englewood Cliffs, NJ, Prentice-Hall, 1962.

E. ALGEBRA
See also N7

E1 Surveys

E1.1 Elementary (At least one of the following)

a. Birkhoff, G. and MacLane, Saunders. Survey of Modern Algebra, 3rd ed. New York, Macmillan Publishing Company, 1965.

b. Fraleigh, John B. First Course in Abstract Algebra, 2nd ed. Reading, MA, Addison-Wesley Publishing Company, 1976.

c. McCoy, Neal H. Introduction to Modern Algebra, 3rd ed. Boston, Allyn and Bacon, 1975.

E1.2 Intermediate (At least one of the following)

a. Goldhaber, Jacob K. and Ehrlich, Gertrude. Algebra. New York, Macmillan Publishing Company, 1970.

b. Goldstein, Larry. Abstract Algebra: A First Course. Englewood Cliffs, NJ, Prentice-Hall, 1973.

c. Herstein, I. N. Topics in Algebra, 2nd ed. New York, John Wiley and Sons, 1975.

d. Jacobson, N. Lectures in Abstract Algebra, vol. 1, 2. New York, Springer-Verlag New York, Vol. 1, 1975; Vol. 2, 1975.

e. Mostow, George D.; Sampson, J. H.; Meyer, J. P. Fundamental Structures of Algebra. New York, McGraw-Hill Book Company, 1963.

f. van der Waerden, Bartel L. Modern Algebra, trans. by Fred Blum, vol. I, II. New York, Frederick Ungar Publishing Company, Vol. I, 1953; Vol. II, 1950.

E1.3 Advanced (At least one of the following)

a. Jacobson, N. Basic Algebra I. San Francisco, W. H. Freeman and Company, 1974.

b. Lang, Serge A. Algebra. Reading, MA, Addison-Wesley Publishing Company, 1965.

c. MacLane, Saunders and Birkhoff, G. Algebra. New York, Macmillan Publishing Company, 1967.

E2 Groups

E2.1 Weyl, Hermann. Symmetry. Princeton, NJ, Princeton University Press, 1952.

E2.2 Budden, F. J. The Fascination of Groups. New York, Cambridge University Press, 1972.

E2.3 (At least one of the following)

a. Hall, Marshall, Theory of Groups. New York, Macmillan Publishing Company, 1961.

b. Kurosh, A. G. The Theory of Groups, vols. I, II, 2nd ed. New York, Chelsea Publishing Company, 1960, reprinted 1970.

c. Rotman, Joseph J. Theory of Groups: An Introduction. Boston, Allyn and Bacon, 1973.

d. Scott, William. Group Theory. Englewood Cliffs, NJ, Prentice-Hall, 1964.

E2.4 Kaplansky, Irving. Infinite Abelian Groups, rev. ed. Ann Arbor, MI, University of Michigan Press, 1969.

E3 Rings and Ideals

E3.1 Commutative Rings (At least one of the following)

a. Atiyah, Michael F. and MacDonald, I. G. Introduction to Commutative Algebra. Reading, MA, Addison-Wesley Publishing Company, 1969.

b. Fulton, William. Algebraic Curves. An Introduction to Algebraic Geometry. Reading, MA, W. A. Benjamin, 1969.

c. Kaplansky, Irving. Commutative Rings, rev. ed. Boston, Allyn and Bacon, 1974.

d. Northcott, D. G. Lessons on Rings, Modules and Multiplicities. New York, Cambridge University Press, 1968.

e. Robinson, A. Numbers and Ideals. San Francisco, Holden-Day, 1965.

E3.2 Noncommutative Rings (At least one of the following)

a. Herstein, I. N. Non-Commutative Rings. Carus Monograph No. 15. Washington, DC, Mathematical Association of America, 1968.

b. Lambek, Joachim. Lectures on Rings and Modules. New York, Blaisdell Publishing Company, 1966. (Out of Print)

E4 Fields

E4.1 (At least one of the following)

a. Artin, Emil. Galois Theory, 2nd rev. ed., edited by A. Milgram. Notre Dame, IN, University of Notre Dame Press, 1966.

b. Gaal, Lisl. Classical Galois Theory with Examples, 2nd ed. New York, Chelsea Publishing Company, 1973.

c. Kaplansky, Irving. Fields and Rings, rev. 2nd ed. Chicago, University of Chicago Press, 1972.

d. Stewart, Ian. Galois Theory. New York, Halsted Press, 1973.

E5 Categories

E5.1 Herrlich, Horst and Strecker, George E. Category Theory: An Introduction. Boston, Allyn and Bacon, 1973.

E5.2 (At least one of the following)

a. MacLane, Saunders. Categories for the Working Mathematician. New York, Springer-Verlag New York, 1972.

b. Mitchell, Barry. Theory of Categories. New York, Academic Press, 1965.

c. Pareigis, B. Categories and Functors. New York, Academic Press, 1970.

F. NUMBER THEORY

F1 History

F1.1 Dickson, Leonard E. History of the Theory of Numbers, vols. I, II, III. New York, Chelsea Publishing Company, 1952.

F1.2 LeVeque, William J. Reviews of Papers in Number Theory, vols. I and VI. Providence, RI, American Mathematical Society, 1974.

F2 Readings

F2.1 (At least one of the following)

a. Friedberg, Richard. An Adventurer's Guide to Number Theory. New York, McGraw-Hill Book Company, 1968.

b. Ogilvy, C. Stanley and Anderson, John T. Excursions in Number Theory. New York, Oxford University Press, 1966.

c. Ore, Oystein. Invitation to Number Theory. New Mathematical Library. Washington, DC, Mathematical Association of America, 1967.

F3 Introductory

F3.1 (At least one of the following)

a. Davenport, H. The Higher Arithmetic: An Introduction to the Theory of Numbers, 3rd ed. Atlantic Highlands, NJ, Humanities Press, 1968.

b. Jones, Burton W. Theory of Numbers. New York, Holt, Rinehart and Winston, 1955. (Out of Print)

c. LeVeque, William J. Elementary Theory of Numbers. Reading, MA, Addison-Wesley Publishing Company, 1962.

d. McCoy, Neal H. Theory of Numbers. New York, Macmillan Publishing Company, 1965.

e. Stark, Harold. Introduction to Number Theory. Chicago, Rand McNally and Company, 1970.

F3.2 (At least two of the following)

a. Bolker, Ethan D. Elementary Number Theory: An Algebraic Approach. Reading, MA, W. A. Benjamin, 1970.

b. Chandrasekharan, K. Introduction to Analytic Number Theory. (Grundlehren vol. 48) New York, Springer-Verlag New York, 1968.

c. Grosswald, Emil. Topics from the Theory of Numbers. New York, Macmillan Publishing Company, 1966.

d. Landau, E. Elementary Number Theory, 2nd ed. New York, Chelsea Publishing Company, 1958.

e. LeVeque, William J. Topics in Number Theory, vol. I. Reading, MA, Addison-Wesley Publishing Company, 1956.

f. Niven, Ivan and Zuckerman, H. S. An Introduction to the Theory of Numbers, 3rd ed. New York, John Wiley and Sons, 1966.

g. Shanks, Daniel. Solved and Unsolved Problems in Number Theory, vol. 1. East Lansing, MI, Spartan Press, 1962. (Out of Print)

h. Stewart, Bonnie M. Theory of Numbers, 2nd ed. New York, Macmillan Publishing Company, 1964.

i. Vinogradov, I. M. Elements of Number Theory. New York, Dover Publications, 1954.

F4 Intermediate

F4.1 (At least one of the following)

a. Hardy, G. H. and Wright, E. M. Introduction to the Theory of Numbers, 4th ed. New York, Oxford University Press, 1960.

b. Sierpiński, W. Theory of Numbers. Mathematical Monographs vol. 42. New York, International Publication Service, 1973.

F4.2 (At least one of the following)

a. Borevich, Z. I. and Shafarevich, I. R. Number Theory. New York, Academic Press, 1966.

b. Davenport, H. Multiplicative Number Theory. Chicago, Rand McNally and Company, 1967.

c. Ireland, Kenneth and Rosen, Michael I. Elements of Number Theory: Including an Introduction to Equations Over Finite Fields. Belmont, CA, Bogden and Quigley, 1972.

d. LeVeque, William J. Topics in Number Theory, vol. II. Reading, MA, Addison-Wesley Publishing Company, 1956.

F4.3 (At least one of the following)

a. Pollard, Harry and Diamond, H. G. The Theory of Algebraic Numbers, 2nd ed. Carus Monograph No. 9. Washington, DC, Mathematical Association of America, 1976.

b. Ribenboim, Paulo. Algebraic Numbers. New York, John Wiley and Sons, 1972.

F5 Special Topics

F5.1 (Two or more of the following)

a. Cassels, J. W. S. An Introduction to Diophantine Approximation. New York, Hafner Press, 1972.

b. Kirch, A. M. Elementary Number Theory: A Computer Approach. New York, Intext Educational Publishers, 1974.

c. Ingham, A. E. The Distribution of Prime Numbers. New York, Hafner Press, 1971.

d. Kac, M. Statistical Independence in Probability, Analysis and Number Theory. Carus Monograph No. 12. Washington, DC, Mathematical Association of America, 1959.

e. Niven, Ivan. Irrational Numbers. Carus Monograph No. 11. Washington, DC, Mathematical Association of America, 1959.

f. Olds, C. D. Continued Fractions. New Mathematical Library. Washington, DC, Mathematical Association of America, 1963.

g. Sierpiński, W. 250 Problems in Elementary Number Theory. New York, American Elsevier Publishing Company, 1970.

G. CALCULUS

G1 History

G1.1 Boyer, Carl B. History of the Calculus and Its Conceptual Development. New York, Dover Publications, 1959.

G1.2 Toeplitz, Otto. Calculus: A Genetic Approach. G. Koethe, ed., L. Lange, Trans. Chicago, University of Chicago Press, 1963.

G2 Elementary

Every library should contain a few introductory calculus books including both brief and longer texts. The books listed below are intended to supplement the more standard texts.

G2.1 Apostol, Tom M., ed. Selected Papers on Calculus. Washington, DC, Mathematical Association of America, 1969.

G2.2 May, Kenneth O., ed. Lectures on Calculus. San Francisco, Holden-Day, 1967.

G2.3 (At least two of the following)

a. Chover, Joshua. The Green Book of Calculus. Reading, MA, W. A. Benjamin, 1972

b. Dorn, William S.; Bitter, Gary G.; Hector, David L. Computer Applications for Calculus. Boston, Prindle, Weber and Schmidt, 1972.

c. Fraleigh, John B. Calculus, A Linear Approach, vol. 1. Reading, MA, Addison-Wesley Publishing Company, 1971.

d. Keisler, H. Jerome. Foundations of Infinitesimal Calculus. Instructor's manual for Elementary Calculus. Boston, Prindle, Weber, and Schmidt, 1976.

e. Levi, Howard. Polynomials, Power Series and Calculus. New York, Van Nostrand Reihnold Company, 1968. (Out of Print)

f. Spivak, Michael. Calculus. Reading, MA, W. A. Benjamin, 1967.

G3 Intermediate

G3.1 Hardy, G. H. A Course of Pure Mathematics. New York, Cambridge University Press, 1959.

G3.2 (At least one of the following)

a. Apostol, Tom M. Calculus, vol. I, II, 2nd ed. New York, John Wiley and Sons, 1967, 1969.

b. Courant, Richard and John, F. Introduction to Calculus and Analysis, vols. I and II. New York, John Wiley and Sons, 1965, 1974.

G3.3 (At least one of the following)

a. Fulks, Watson. Advanced Calculus, 2nd ed. New York, John Wiley and Sons, 1969.

b. Spiegel, Murray R. Advanced Calculus. New York, McGraw-Hill Book Company, 1963.

G3.4 Osserman, Robert. Two-Dimensional Calculus. New York, Harcourt Brace Jovanovich, 1968. (Out of Print)

G3.5 (At least one of the following)

a. Flanigan, Francis J. and Kazdan, Jerry L. Calculus Two: Linear and Nonlinear Functions. Englewood Cliffs, NJ, Prentice-Hall, 1971.

b. Trench, William F. and Kolman, Bernard. Multivariable Calculus with Linear Algebra and Series. New York, Academic Press, 1972.

c. Williamson, Richard E.; Crowell, Richard H.; Trotter, Hale F. Calculus of Vector Functions, 3rd ed. Englewood Cliffs, NJ, Prentice-Hall, 1972.

G4 Advanced

G4.1 (At least one of the following)

a. Buck, R. C. Advanced Calculus, 2nd ed. New York, McGraw-Hill Book Company, 1965.

b. Edwards, C. H., Jr. Advanced Calculus of Several Variables. New York, Academic Press, 1973.

c. Fleming, Wendell H. Functions of Several Variables. Reading, MA, Addison-Wesley Publishing Company, 1965. (Out of Print)

d. Goffman, Casper. Calculus of Several Variables. New York, Harper and Row Publishers, 1965. (Out of Print)

e. Sagan, Hans. Advanced Calculus of Real-Valued Functions of a Real Variable and Vector-Valued Functions of a Vector Variable. Boston, Houghton-Mifflin Company, 1974.

G4.2 Spivak, Michael. Calculus on Manifolds. Reading, MA, W. A. Benjamin, 1965.

G4.3 (At least one of the following) See also H4.2

a. Bartle, Robert G. Elements of Real Analysis, 2nd ed. New York, John Wiley and Sons, 1976.

b. Devinatz, Allen. Advanced Calculus. New York, Holt, Rinehart and Winston, 1968. (Out of Print)

c. Marsden, Jerrold. Elementary Classical Analysis. San Francisco, W. H. Freeman and Company, 1974.

d. Rossi, Hugo. Advanced Calculus. Reading, MA, W. A. Benjamin, 1970. (Out of Print)

G4.4 Loomis, Lynn H. and Sternberg, Shlomo. Advanced Calculus. Reading, MA, Addison-Wesley Publishing Company, 1968.

H1 General

H1.1 Dieudonné, Jean. Treatise on Analysis, 4 vols. New York, Academic Press, vol. 1, 1969; vol. 2, 1970; vol. 3, 1972; vol. 4, 1974.

H1.2 Gelbaum, Bernard and Olmsted, John. Counterexamples in Analysis. San Francisco, Holden-Day, 1964.

H1.3 Gleason, Andrew M. Fundamentals of Abstract Analysis. Reading, MA, Addison-Wesley Publishing Company, 1966.

H1.4 Hawkins, Thomas. Lebesgue's Theory of Integration. Its Origins and Development, 2nd ed. New York, Chelsea Publishing Company, 1975.

H1.5 Pólya, George and Szegö, Gabor. Problems and Theorems in Analysis, 2 vols. New York, Springer-Verlag New York, vol. 1, 1972; vol. 1, 1975.

H1.6 Rudin, Walter. Real and Complex Analysis, 2nd ed. New York, McGraw-Hill Book Company, 1974.

H1.7 Titchmarsh, Edward C. Theory of Functions, 2nd ed. New York, Oxford University Press, 1939.

H1.8 Whittaker, Edmund T. and Watson, G. N. A Course of Modern Analysis, 4th ed. New York, Cambridge University Press, 1958.

H2 Number Systems

H2.1 (At least one of the following)

a. Cohen, Leon W. and Ehrlich, G. The Structure of the Real Number System. New York, Van Nostrand Reinhold Company, 1963. (Out of Print)

b. Feferman, Solomon. The Number Systems: Foundations of Algebra and Analysis. Reading, MA, Addison-Wesley Publishing Company, 1964.

c. Landau, Edmund G. H. The Foundations of Analysis, 2nd ed., trans. by E. Steinhardt. New York, Chelsea Publishing Company, 1960.

H3 Inequalities

H3.1 (At least one of the following)

a. Beckenbach, E. F. and Bellman, R. Inequalities. New York, Springer-Verlag New York, 1961.

b. Hardy, G. H.; Littlewood, J. E.; Pólya, G. Inequalities, 2nd ed. New York, Cambridge University Press, 1952.

c. Mitrinović, D. S. and Vasić, P. H. Analytic Inequalities. New York, Springer-Verlag New York, 1970.

H3.2 Kazarinoff, N. D. Analytic Inequalities. New York, Holt, Rinehart and Winston, 1961.

H4 Real Analysis

H4.1 Boas, Ralph P., Jr. A Primer of Real Functions, 2nd ed. Carus Monograph No. 13. Washington, DC, Mathematical Association of America, 1972.

H4.2 (At least one of the following)

a. Cronin-Scanlon, Jane. Advanced Calculus: A Start in Analysis, rev. ed. Lexington, MA, D. C. Heath and Company, 1969.

b. Rudin, Walter. Principles of Mathematical Analysis, 3rd ed. New York, McGraw-Hill Book Company, 1976.

c. Smith, K. Primer of Modern Analysis. Belmont, CA, Bogden and Quigley, 1971.

d. Sprecher, David A. Elements of Real Analysis. New York, Academic Press, 1970.

H4.3 Goffman, Casper. Real Functions, rev. ed. Boston, Prindle, Weber and Schmidt, 1967.

H4.4 Beals, R. Advanced Mathematical Analysis. New York, Springer-Verlag New York, 1973.

H4.5 (At least one of the following)

a. Hewitt, E. and Stromberg, K. Real and Abstract Analysis, a Modern Treatment of the Theory of Functions of a Real Variable. New York, Springer-Verlag New York, 1969.

b. Royden, H. R. Real Analysis, 2nd ed. New York, Macmillan Publishing Company, 1968.

H4.6 (At least one of the following)

a. Burkill, John C. The Lebesgue Integral. New York, Cambridge University Press, 1951.

b. Rogosinski, Werner. Volume and Integral. New York, Halsted Press, 1952.

c. Temple, George. The Structure of Lebesgue Integration Theory. New York, Oxford University Press, 1971.

H4.7 (At least one of the following)

a. Halmos, Paul R. Measure Theory. New York, Springer-Verlag New York, 1974.

b. Munroe, Marshall Evans. Introduction to Measure and Integration, 2nd ed. Reading, MA, Addison-Wesley Publishing Company, 1971.

c. Taylor, S. J. Introduction to Measure and Integration. New York, Cambridge University Press, 1973.

or

c. Kingman, J. F. C. and Taylor, S. J. Introduction to Measure with Probability. New York, Cambridge University Press, 1966.

H5 Complex Analysis

H5.1 Introductory

H5.1 Knopp, Konrad. Theory of Functions, Parts I and II and Problem Books I and II, trans. by F. Bagemihl. New York, Dover Publications, Part I, 1945; Part II, 1947. Problem Books I, II, 1968.

H5.2 Applications (At least one of the following)

a. Churchill, Ruel V.; Brown, James W.; Verhey, Roger. Complex Variables and Applications, rev. ed. New York, McGraw-Hill Book Company, 1974.

b. Fuchs, B. A. and Shabat, B. V. Functions of a Complex Variable and Some of Their Applications, trans. by J. Berry, ed. by T. Kovari. Elmsford, NY, Pergamon Press, vol. I, rev. and exp. by J. W. Reed, 1964; vol. II, 1962.

c. Levinson, Norman and Redheffer, Raymond M. Complex Variables. San Francisco, Holden-Day, 1970.

H5.3 (At least one of the following)

a. Ahlfors, Lars V. Complex Analysis, 2nd ed. New York, McGraw-Hill Book Company, 1966.

b. Nehari, Zeev. Introduction to Complex Analysis, rev. ed. Boston, Allyn and Bacon, 1968. (Out of Print)

c. Nevanlinna, Rolf and Paatero, V. Introduction to Complex Analysis, trans. by T. Kovari and G. S. Goodman. Reading, MA, Addison-Wesley Publishing Company, 1969.

H5.4 Advanced (At least one of the following)

a. Conway, John B. Functions of One Complex Variable. New York, Springer-Verlag New York, 1973.

b. Heins, Maurice. Complex Function Theory. New York, Academic Press, 1968.

c. Henrici, P. Applied and Computational Complex Analysis, vol. I. New York, John Wiley and Sons, 1974.

d. Hille, Einar. Analytic Function Theory, vols. I, II. New York, Chelsea Publishing Company, 1973. (Reprint)

e. Saks, S. and Zygmund, A. Analytic Functions, 3rd ed., trans. by E. J. Scott. New York, American Elsevier Publishing Company, 1971.

H5.5 Littlewood, J. E. Some Problems in Real and Complex Analysis. Lexington, MA, D. C. Heath and Company, 1968.

H5.6 Springer, George M. Introduction to Riemann Surfaces. Reading, MA, Addison-Wesley Publishing Company, 1957.

H6 Ordinary Differential Equations See also M6

H6.1 Elementary (At least two of the following)

a. Boyce, William and DiPrima, R. C. Elementary Differential Equations and Boundary Value Problems, 2nd ed. New York, John Wiley and Sons, 1969.

b. Coddington, Earl A. An Introduction to Ordinary Differential Equations. Englewood Cliffs, NJ, Prentice-Hall, 1964.

c. Kreider, Donald L.; Kuller, Robert G.; Ostberg, Donald R. Elementary Differential Equations. Reading, MA, Addison-Wesley Publishing Company, 1968.

d. Plaat, Otto. Ordinary Differential Equations. San Francisco, Holden-Day, 1971.

e. Rabenstein, Albert L. Elementary Differential Equations with Linear Algebra. New York, Academic Press, 1970.

f. Simmons, George F. Differential Equations with Applications and Historical Notes. New York, McGraw-Hill Book Company, 1972.

H6.2 (At least one of the following)

a. Braun, M. Differential Equations and Their Applications: An Introduction to Applied Mathematics. New York, Springer-Verlag New York, 1975.

b. Carrier, George F. and Pearson, Carl E. Ordinary Differential Equations. New York, John Wiley and Sons, 1968.

c. Dickinson, Alice B. Differential Equations: Theory and Use in Time and Motion. Reading, MA, Addison-Wesley Publishing Company, 1972.

H6.3 Advanced General (At least one of the following)

a. Birkhoff, Garrett and Rota, Gian-Carlo. Ordinary Differential Equations, 2nd ed. New York, John Wiley and Sons, 1969.

b. Coddington, Earl A. and Levinson, Norman. Theory of Ordinary Differential Equations. New York, McGraw-Hill Book Company, 1955.

c. Goldberg, J. L. and Schwartz, A. J. Systems of Ordinary Differential Equations: An Introduction. New York, Harper and Row Publishers, 1972.

H6.4 Arnold, V. I. Ordinary Differential Equations, trans. by Richard A. Silverman. Cambridge, MA, MIT Press, 1973.

H6.5 Hirsch, Morris W. and Smale Stephen. Differential Equations, Dynamical Systems and Linear Algebra. New York, Academic Press, 1974.

H6.6 Difference Equations (At least one of the following)

a. Goldberg, Samuel. Introduction to Difference Equations. New York, John Wiley and Sons, 1958.

b. Levy, H. and Lessman, F. Finite Difference Equations. Sir Isaac Pittman and Sons, 1959.

H7 Partial Differential Equations

H7.1 (At least one of the following)

a. Berg, Paul W. and McGregor, James L. Elementary Partial Differential Equations. San Francisco, Holden-Day, 1966.

b. Epstein, Bernard. Partial Differential Equations, An Introduction. Huntington, NY, Robert E. Krieger Publish-Company, 1975. (Reprint)

c. Weinberger, H. F. A First Course in Partial Differential Equations: with Complex Variables and Transform Methods. Lexington, MA, Xerox College Publishing, 1965.

H7.2 (At least one of the following)

a. Garabedian, P. R. Partial Differential Equations. New York, John Wiley and Sons, 1964.

b. Hellwig, Gunter. Partial Differential Equations. New York, Blaisdell Publishing Company, 1964. (Out of Print)

c. John, C. F. Partial Differential Equations, 2nd ed. New York, Springer-Verlag New York, 1975.

H8 Infinite Series

H8.1 (At least one of the following)

a. Bromwich, T. J. I'A. An Introduction to the Theory of Infinite Series. New York, Macmillan Publishing Company, 1965.

b. Knopp, Konrad. Theory and Application of Infinite Series, trans. from the 2nd German ed. New York, Hafner Press, 1948.

H8.2 Hardy, G. H. Divergent Series. New York, Oxford University Press, 1949.

H8.3 Knopp, Konrad. Infinite Sequences and Series, trans. by F. Bagemihl. New York, Dover Publications, 1956.

H9 Fourier Analysis

H9.1 (At least one of the following)

a. Jackson, Dunham. Fourier Series and Orthogonal Polynomials. Washington, DC, Mathematical Association of America, 1941.

b. Rogosinski, Werner. Fourier Series, 2nd ed., trans. by R. A. Silverman. New York, Chelsea Publishing Company, 1962.

c. Seeley, Robert T. Introduction to Fourier Series and Integrals. Reading, MA, W. A. Benjamin, 1966.

H9.2 (At least one of the following)

a. Tolstov, Georgy P. Fourier Series, 2nd ed. trans. by R. A. Silverman. New York, Dover Publications, 1962.

b. Zygmund, Antoni. Trigonometric Series, vol. 1, rev. ed. New York, Cambridge University Press, 1968.

H9.3 Katznelson, Y. Introduction to Harmonic Analysis. New York, John Wiley and Sons, 1968. (Out of Print)

H10 Generalized Functions

H10.1 (At least one of the following)

a. Challifour, John I. Generalized Functions and Fourier Analysis: An Introduction. Reading, MA, W. A. Benjamin, 1972.

b. Lighthill, Michael James. Introduction to Fourier Analysis and Generalised Functions. New York, Cambridge University Press, 1958.

H11 Functional Analysis

H11.1 Simmons, George F. Introduction to Topology and Modern Analysis. New York, McGraw-Hill Book Company, 1963.

H11.2 (At least one of the following)

a. Epstein, Bernard. Linear Functional Analysis: Introduction to Lebesgue Integration and Infinite Dimensional Problems. Philadelphia, W. B. Saunders Company, 1970.

b. Kolmogorov, A. N. and Fomin, S. V. Introductory Real Analysis. New York, Dover Publications, 1975.

H11.3 (At least one of the following)

a. Bachman, George and Narici, Lawrence. Functional Analysis. New York, Academic Press, 1966.

b. Hille, Einar. Methods in Classical and Functional Analysis. Reading, MA, Addison-Wesley Publishing Company, 1971.

c. Liusternik, L. and Sobolev, V. Elements of Functional Analysis. New York, Frederick Ungar Publishing Company, 1961.

d. Riesz, Frigyes and Nagy, Bela Sz. Functional Analysis, trans. by L. F. Boron. New York, Frederick Ungar Publishing Company, 1955.

e. Rudin, Walter. Functional Analysis. New York, McGraw-Hill Book Company, 1973.

f. Taylor, Angus E. Introduction to Functional Analysis. New York, John Wiley and Sons, 1958.

H12 Calculus of Variations

H12.1 (At least one of the following)

a. Bliss, Gilbert A. Calculus of Variations. Carus Monograph No. 1. Washington, DC, Mathematical Association of America, 1925. (Reprint)

b. Ewing, George W. Calculus of Variations with Applications. New York, W. W. Norton and Company, 1969.

H13 Optimal Control

H13.1 (At least one of the following)

a. Berkovitz, L. D. Optimal Control Theory. New York, Springer-Verlag New York, 1974.

b. Boltyanskii, V. G. Mathematical Methods of Optimal Control, trans. by K. N. Trirogoff. New York, Holt, Rinehart and Winston, 1971. (Out of Print)

c. Lee, E. B. and Markus, L. Foundations of Optimal Control. New York, John Wiley and Sons, 1967.

d. Young, L. C. Lectures on Calculus of Variations and Optimal Control Theory. Philadelphia, W. B. Saunders Company, 1969.

I1 History

I1.1 Lanczos, Cornelius. Space Through the Ages. New York, Academic Press, 1970.

I2 General

I2.1 (At least one of the following)

a. Coxeter, H. S. M. Introduction to Geometry, 2nd ed. New York, John Wiley and Sons, 1969.

b. Eves, Howard. A Survey of Geometry, 2nd rev. ed. Boston, Allyn and Bacon, 1972.

c. Ewald, Gunter. Geometry: An Introduction. Belmont, CA, Wadsworth Publishing Company, 1971.

d. Pedoe, D. A Course of Geometry for Colleges and Universities. New York, Cambridge University Press, 1970.

I2.2 Hilbert, David and Cohn-Vossen, S. Geometry and the Imagination. New York, Chelsea Publishing Company, 1952.

I3 Foundations

I3.1 (At least one of the following)

a. Fishback, William T. Projective and Euclidean Geometry, 2nd ed. New York, John Wiley and Sons, 1969.

b. Moise, Edwin E. Elementary Geometry from an Advanced Standpoint, 2nd ed. Reading, MA, Addison-Wesley Publishing Company, 1974.

c. Prenowitz, Walter and Jordan, M. Basic Concepts of Geometry. New York, John Wiley and Sons, 1965.

d. Wylie, Clarence R. Foundations of Geometry. New York, McGraw-Hill Book Company, 1964.

I4 Geometric Figures

I4.1 Curves (At least one of the following)

a. Lawrence, J. Dennis. Catalog of Special Plane Curves. New York, Dover Publications, 1972.

b. Yates, Robert C. Curves and Their Properties. Reston, VA, National Council of Teachers of Mathematics, 1974.

I4.2 Convex Figures (At least one of the following)

a. Grünbaum, Branko. Convex Polytopes. New York, John Wiley and Sons, 1967.

b. Hadwiger, Hugo and Debrunner, Hans. Combinatorial Geometry in the Plane. New York, Holt, Rinehart and Winston, 1964. (Out of Print)

c. Yaglom, I. M. and Boltyanskii, V. G. Convex Figures. New York, Holt, Rinehart and Winston, 1961. (Out of Print)

I4.3 Polyhedra (At least one of the following)

a. Holden, Alan. Shapes, Space, and Symmetry. New York, Columbia University Press, 1971.

b. Wenninger, M. J. Polyhedron Models. New York, Cambridge University Press, 1971.

I5 Geometric Inequalities

I5.1 Kazarinoff, Nicholas D. Geometric Inequalities. Washington, DC, Mathematical Association of America, 1961.

I6 Non-Euclidean Geometry

I6.1 (At least one of the following)

a. Gans, David. An Introduction to Non-Euclidean Geometry. New York, Academic Press, 1973.

b. Kulczycki, Stefan. Non-Euclidean Geometry. Elmsford, NY, Pergamon Press, 1961. (Out of Print)

c. Wolfe, Harold E. Introduction to Non-Euclidean Geometry. New York, Holt, Rinehart and Winston, 1945.

I7 Projective Geometry

I7.1 Elementary (At least one of the following)

a. Coxeter, H. S. M. Projective Geometry, 2nd ed. Buffalo, NY, University of Toronto Press, 1974.

b. Dorwart, Harold L. Geometry of Incidence. New Haven, CT, Autotelic Instructional Materials Publishers, 1966.

c. Young, J. W. Projective Geometry. Carus Monograph No. 4. Washington, DC, Mathematical Association of America, 1930.

I7.2 Intermediate (At least one of the following)

a. Blattner, John W. Projective Plane Geometry. San Francisco, Holden-Day, 1968.

b. Pedoe, D. An Introduction to Projective Geometry. Elmsford, NY, Pergamon Press, 1963.

c. Seidenberg, A. Lectures in Projective Geometry. New York, Van Nostrand Reinhold Company, 1962.

d. Wylie, C. Ray. Introduction to Projective Geometry. New York, McGraw-Hill Book Company, 1970.

I7.3 Interplay of algebra, combinatorics and projective geometry (At least one of the following)

a. Albert, A. Adrian and Sandler, Reuben. Introduction to Finite Projective Planes. New York, Holt, Rinehart and Winston, 1968. (Out of Print)

b. Blumenthal, Leonard M. Modern View of Geometry. San Francisco, W. H. Freeman and Company, 1961.

I8 Vector Geometry

I8.1 (At least one of the following)

a. Hausner, Melvin. Vector Space Approach to Geometry. Englewood Cliffs, NJ, Prentice-Hall, 1965.

b. Schuster, Seymour. Elementary Vector Geometry. New York, John Wiley and Sons, 1962. (Out of Print)

I9 Transformation Geometry

I9.1 Elementary (At least one of the following)

a. Eccles, Frank M. An Introduction to Transformational Geometry. Reading, MA, Addison-Wesley Publishing Company, 1971.

b. Yaglom, I. M. Geometric Transformations, 3 vols. Washington, DC, Mathematical Association of America, vol. 1, 1962; vol. 2, 1969; vol. 3, 1973.

I9.2 Intermediate (At least one of the following)

a. Gans, David. Transformations and Geometries. Englewood Cliffs, NJ, Prentice-Hall, 1969.

b. Guggenheimer, Heinrich W. Plane Geometry and Its Graphs. San Francisco, Holden-Day, 1967.

c. Jeger, Max. Transformation Geometry. New York, American Elsevier Publishing Company, 1966.

I10 Geometry via linear algebra

I10.1 (At least one of the following)

a. Artzy, Rafael. Linear Geometry. Reading, MA, Addison-Wesley Publishing Company, 1974. (Reprint)

b. Rosenbaum, Robert A. Introduction to Projective Geometry and Modern Algebra. Reading, MA, Addison-Wesley Publishing Company, 1963.

I10.2 (At least one of the following)

a. Baer, Reinhold. Linear Algebra and Projective Geometry. New York, Academic Press, 1952.

b. Dieudonné, Jean. Linear Algebra and Geometry. Boston, Houghton Mifflin Company, 1969.

c. Kaplansky, Irving. Linear Algebra and Geometry: A Second Course. New York, Chelsea Publishing Company, 1974.

I10.3 (At least one of the following)

a. Artin, Emil. Geometric Algebra. New York, John Wiley and Sons, 1957.

b. Snapper, Ernst and Troyer, Robert J. Metric Affine Geometry. New York, Academic Press, 1971.

I11 Algebraic Geometry

I11.1 (At least one of the following)

a. Jenner, William E. Rudiments of Algebraic Geometry. New York, Oxford University Press, 1963.

b. Seidenberg, A. Elements of the Theory of Algebraic Curves. Reading, MA, Addison-Wesley Publishing Company, 1968.

c. Walker, Robert J. Algebraic Curves. New York, Dover Publications, 1962. (Out of Print)

I12 Differential Geometry

I12.1 (At least one of the following)

a. O'Neill, Barrett. Elementary Differential Geometry. New York, Academic Press, 1966.

b. Spivak, Michael. A Comprehensive Introduction to Differential Geometry. Boston, Publish or Perish, 1970-.

c. Stoker, J. J. Differential Geometry. New York, John Wiley and Sons, 1969.

d. Struik, Dirk Jan. Differential Geometry, 2nd ed. Reading, MA, Addison-Wesley Publishing Company, 1961.

J. TOPOLOGY

J1 Intuitive Approaches to Topology

J1.1 (At least two of the following)

a. Bing, R. H. Elementary Point Set Topology. Slaught Memorial Paper No. 8. Washington, DC, Mathematical Association of America, 1960.

b. Chinn, William G. and Steenrod, Norman E. First Concepts of Topology. Washington, DC, Mathematical Association of America, 1966.

c. Fréchet, Maurice and Fan, Ky. Initiation to Combinatorial Topology. Boston, Prindle, Weber and Schmidt, 1967.

d. Lietzmann, Walter. Visual Topology. New York, American Elsevier Publishing Company, 1965.

J2 General Topology

J2.1 Introductory (At least one of the following)

a. Eisenberg, Murray. Introduction to Topology. New York, Holt, Rinehart and Winston, 1974.

b. Gemignani, Michael C. Elementary Topology, 2nd ed. Reading, MA, Addison-Wesley Publishing Company, 1972.

c. Hall, Dick W. and Spencer, G. L. Elementary Topology. New York, John Wiley and Sons, 1955. (Out of Print)

d. Kuratowski, K. Introduction to Set Theory and Topology, 2nd ed. Elmsford, NY, Pergamon Press, 1972.

e. O'Neil, Peter V. Fundamental Concepts of Topology. New York, Gordon and Breach Science Publishers, 1972.

J2.2 Advanced (At least one of the following)

a. Bourbaki, Nicolas. Elements of Mathematics, General Topology, Parts 1 and 2. Reading, MA, Addison-Wesley Publishing Company, 1966; 1967.

b. Dugundji, James. Topology. Boston, Allyn and Bacon, 1966.

c. Kelley, John L. General Topology. New York, Springer-Verlag New York, 1975. (Reprint)

d. Kuratowski, K. Topology, vol. 1, 2. New York, Academic Press, 1966; 1969.

e. Munkres, James R. Topology: A First Course. Englewood Cliffs, NJ, Prentice-Hall, 1975.

f. Willard, Stephen. General Topology. Reading, MA, Addison-Wesley Publishing Company, 1970.

J2.3 Specific Topological Spaces

J2.3 Steen, Lynn A. and Seebach, J. Arthur. Counterexamples in Topology. New York, Holt, Rinehart and Winston, 1970.

J3 Algebraic Topology

J3.1 Introductory (Homotopy)

J3.1 Massey, William S. Algebraic Topology: An Introduction. New York, Harcourt Brace Jovanovich, 1967.

J3.2 Introductory (Homology) (At least one of the following)

a. Mayer, Joerg. Algebraic Topology. Englewood Cliffs, NJ, Prentice-Hall, 1972.

b. Wallace, A. H. Introduction to Algebraic Topology. Elmsford, NY, Pergamon Press, 1957. (Out of Print)

J3.3 Advanced (At least one of the following)

a. Greenberg, Marvin. Lectures on Algebraic Topology. Reading, MA, W. A. Benjamin, 1973.

b. Maunder, C. R. F. Introduction to Algebraic Topology. New York, Van Nostrand Reinhold Company, 1970.

c. Spanier, Edwin H. Algebraic Topology. New York, McGraw-Hill Book Company, 1966.

d. Vick, James. Homology Theory: An Introduction to Algebraic Topology. New York, Academic Press, 1973.

J4 Differential Topology

J4.1 (At least one of the following)

a. Guillemin, Victor and Pollack, Alan. Differential Topology. Englewood Cliffs, NJ, Prentice-Hall, 1974.

b. Milnor, John. Topology from the Differentiable Viewpoint. Charlottesville, VA, University Press of Virginia, 1965.

c. Wallace, A. H. Differential Topology: First Steps. Reading, MA, W. A. Benjamin, 1968.

J5 Dimension Theory

J5.1 Hurewicz, Witold and Wallman, Henry. Dimension Theory. Princeton, NJ, Princeton University Press, 1941.

J6 Topological Groups

J6.1 Pontryagin, Lev S. Topological Groups, 2nd ed. New York, Gordon and Breach Science Publishers, 1966.

J7 Interplay of General, Algebraic and Differential Approaches

J7.1 Singer, I. M. and Thorpe, John A. Lecture Notes on Elementary Topology and Geometry. Glenview, IL, Scott, Foresman and Company, 1967. (Out of Print)

K. PROBABILITY

K1 History

K1.1 David, F. N. Games, Gods, and Gambling. New York, Hafner Press, 1962.

K1.2 Maistrov, Leonid. Probability Theory, A Historical Sketch. New York, Academic Press, 1974.

K2 Foundations

K2.1 DeFinetti, Bruno. Theory of Probability: A Critical Introductory Treatment, vol. I. New York, John Wiley and Sons, 1974

K2.2 Fine, Terrence L. Theories of Probability: An Examination of Foundations. New York, Academic Press, 1973.

K3 Elementary

K3.1 (At least one of the following)

a. Berman, Simeon M. Elements of Probability. Reading, MA, Addison-Wesley Publishing Company, 1969.

b. Draper, Norman R. and Lawrence, Willard E. Probability, An Introductory Course. Chicago, Rand McNally and Company, 1970.

c. Dwass, M. First Steps in Probability. New York, McGraw-Hill Book Company, 1967.

d. Eisen, Martin M. and Eisen, Carole A. Probability and Its Applications. New York, Quantum Publishers, 1975.

e. Gangoli, R. A. and Ylvisaker, D. Discrete Probability. New York, Harcourt Brace Jovanovich, 1967.

f. Gemignani, Michael. Finite Probability. Reading, MA Addison-Wesley Publishing Company, 1970.

g. Goldberg, Samuel. Probability: An Introduction. Englewood Cliffs, NJ, Prentice-Hall, 1960.

h. Hodges, J. L. and Lehmann, E. L. Elements of Finite Probability, 2nd ed. San Francisco, Holden-Day, 1970.

i. Mosteller, F., et al. Probability with Statistical Applications, 2nd ed. Reading, MA, Addison-Wesley Publishing Company, 1970.

j. Scheerer, Anne C. Probability on Discrete Sample Spaces with Applications. New York, Intext Educational Publishers, 1969.

K3.2 (At least one of the following)

a. Levinson, Horace C. Chance, Luck and Statistics, 2nd ed. New York, Dover Publications, 1963.

b. Rényi, Alfred. Letters on Probability. Detroit, MI, Wayne State University Press, 1973.

c. von Mises, Richard. Probability, Statistics, and Truth, 2nd ed. New York, Macmillan Publishing Company, 1957. (Out of Print)

K4 Intermediate

K4.1 Chung, K. L. Elementary Probability Theory. New York, Springer-Verlag New York, 1974.

K4.2 Feller, William. An Introduction to Probability Theory and Its Applications, vol. I, 3rd ed. New York, John Wiley and Sons, 1968.

K4.3 (At least one of the following)

a. Breiman, Leo. Probability and Stochastic Processes, with a View Towards Applications. Boston, Houghton Mifflin Company, 1969.

b. Dwass, Meyer. Probability: Theory and Applications. Reading, MA, W. A. Benjamin, 1969.

c. Hoel, Paul G.; Port, Sidney C.; Stone, Charles J. Introduction to Probability Theory. Boston, Houghton Mifflin Company, 1971.

d. Parzen, Emanuel. Modern Probability Theory and Its Applications. New York, John Wiley and Sons, 1960.

e. Pfeiffer, Paul and Schum, David, eds. Introduction to Applied Probability. New York, Academic Press, 1973.

f. Ross, Sheldon M. Introduction to Probability Models. New York, Academic Press, 1972.

g. Thomasian, Aram J. The Structure of Probability Theory with Applications. New York, McGraw-Hill Book Company, 1969.

h. Yeh, Rui Zong. Modern Probability Theory. New York, Harper and Row Publishers, 1973.

K4.4 (At least one of the following)

a. Hoel, Paul G.; Port, Sidney C.; Stone, Charles J. Introduction to Stochastic Processes. Boston, Houghton Mifflin Company, 1972.

b. Karlin, Samuel and Taylor, Howard M. A First Course in Stochastic Processes, 2nd ed. New York, Academic Press, 1975.

c. Parzen, Emanuel. Stochastic Processes. San Francisco, Holden-Day, 1962.

d. Rosenblatt, Murray. Random Processes, 2nd ed. New York, Springer-Verlag New York, 1974.

K4.5 (At least one of the following)

a. Bartholomew, D. J. Stochastic Models for Social Processes, 2nd ed. New York, John Wiley and Sons, 1973.

b. Cox, D. R. and Smith, W. L. Queues. New York, Halsted Press, 1961.

c. Gross, Donald and Harris, Carl M. Fundamentals of Queueing Theory. New York, John Wiley and Sons, 1974.

d. Haight, F. A. Mathematical Theories of Traffic Flow. New York, Academic Press, 1963.

K5 Advanced

K5.1 Loève, Michel Moise. Probability Theory, 3rd ed. New York, Springer-Verlag New York, 1975.

K5.2 (At least one of the following)

a. Ash, R. B. Real Analysis and Probability. New York, Academic Press, 1972.

b. Breiman, L. Probability. Reading, MA, Addison-Wesley Publishing Company, 1968.

c. Chung, K. L. A Course in Probability Theory, 2nd ed. New York, Academic Press, 1974.

d. Feller, William. An Introduction to Probability Theory and Its Applications, vol. II, 2nd ed. New York, John Wiley and Sons, 1971.

e. Moran, Partick A. Introduction to Probability Theory. New York, Oxford University Press, 1968.

f. Neveu, J. Mathematical Foundations of the Calculus of Probability. San Francisco, Holden-Day, 1965.

g. Rényi, A. Foundations of Probability. San Francisco, Holden-Day, 1970.

h. Tucker, Howard G. A Graduate Course in Probability. New York, Academic Press, 1967.

K5.3 (At least one of the following)

a. Chung, K. L. Markov Chains with Stationary Transition Probabilities, 2nd ed. New York, Springer-Verlag New York, 1967.

b. Cramer, H. Random Variables and Probability Distributions, 3rd ed. New York, Cambridge University Press, 1970.

c. Cramer, H. and Leadbetter, M. R. Stationary and Related Stochastic Processes. New York, John Wiley and Sons, 1970.

d. DeFinetti, Bruno. Probability, Induction, and Statistics. New York, John Wiley and Sons, 1972.

e. Dubins, L. E. and Savage, L. J. How to Gamble If You Must. New York, Dover Publications, 1965.

f. Freedman, D. Markov Chains, vol. I. San Francisco, Holden-Day, 1970.

L. STATISTICS
See also A6.3 and N9

L1 General

L1.1 Tanur, Judith M. and Mosteller, Frederick, eds. Statistics: A Guide to the Unknown. San Francisco, Holden-Day, 1972

L1.2 (At least one of the following)

a. Kirk, Roger E., ed. Statistical Issues: A Reader for the Behavioral Sciences. Monterey, CA, Brooks/Cole Publishing Company, 1972.

b. Lieberman, Bernhardt, ed. Contemporary Problems in Statistics: A Book of Readings for the Behavioral Sciences. New York, Oxford University Press, 1970.

c. Tufte, Edward R. The Quantitative Analysis of Social Problems. Reading, MA, Addison-Wesley Publishing Company, 1970.

L1.3 Barnett, Vic. Comparative Statistical Inference. New York, John Wiley and Sons, 1973.

L2 Elementary

L2.1 (At least one of the following)

a. Alder, Henry and Roessler, Edward B. Introduction to Probability and Statistics, 5th ed. San Francisco, W. H. Freeman and Company, 1972.

b. Freund, John E. Modern Elementary Statistics, 3rd ed. Englewood Cliffs, NJ, Prentice-Hall, 1967.

c. Hoel, Paul C. Elementary Statistics, 3rd ed. New York, John Wiley and Sons, 1971.

d. Wolf, Frank L. Elements of Probability and Statistics, 2nd ed. New York, McGraw-Hill Book Company, 1974.

L2.2 (At least one of the following)

a. Blalock, Hubert M., Jr. Social Statistics, 2nd ed. New York, McGraw-Hill Book Company, 1972.

b. Dixon, Wilfrid J. and Massey, F. J., Jr. Introduction to Statistical Analysis, 3rd ed. New York, McGraw-Hill Book Company, 1969.

c. Hodges, Joseph L. and Lehmann, E. L. Basic Concepts of Probability and Statistics, 2nd ed. San Francisco, Holden-Day, 1970.

d. Lohnes, Paul R. and Cooley, William W. Introduction to Statistical Procedures with Computer Exercises. New York, John Wiley and Sons, 1968.

L2.3 (At least one of the following)

a. Mosteller, Frederick and Rourke, Robert E. K. Sturdy Statistics: Nonparametrics and Order Statistics. Reading, MA, Addison-Wesley Publishing Company, 1973.

b. Noether, Gottfried. Introduction to Statistics: A Fresh Approach. Boston, Houghton Mifflin Company, 1971.

L2.4 (At least one of the following)

a. Chernoff, Herman and Moses, L. E. Elementary Decision Theory. New York, John Wiley and Sons, 1959.

b. Savage, I. Richard. Statistics: Uncertainty and Behavior. Boston, Houghton Mifflin Company, 1968.

c. Winkler, Robert L. An Introduction to Bayesian Inference and Decision. New York, Holt, Rinehart and Winston, 1972.

L2.5 (At least one of the following)

a. Aaker, David A. Multivariate Analysis in Marketing: Theory and Application. Belmont, CA, Wadsworth Publishing Company, 1971.

b. Harris, Richard J. A Primer of Multivariate Statistics. New York, Academic Press, 1975.

L2.6 (At least one of the following)

a. Dunn, Olive Jean and Clark, Virginia A. Applied Statistics: Analysis of Variance and Regression. New York, John Wiley and Sons, 1974.

b. Lindman, Harold R. Analysis of Variance in Complex Experimental Design. San Francisco, W. H. Freeman and Company, 1974.

c. Mendenhall, William. Introduction to Linear Models and the Design and Analysis of Experiments. North Scituate, MA, Duxbury Press, 1968.

L2.7 (At least one of the following)

a. Konijn, H. S. Statistical Theory of Sample Survey Design and Analysis. New York, North-Holland Publishing Company, 1973.

b. Mendenhall, William; Ott, Lyman; Schaeffer, Richard L. Elementary Survey Sampling. North Scituate, MA, Duxbury Press, 1971.

c. Sukhatme, P. V. and Sukhatme, B. V. Sampling Theory of Surveys with Applications, 2nd ed. Ames, IA, Iowa State University Press, 1970.

L3 Intermediate

L3.1 (At least one of the following)

a. Brunk, H. D. Introduction to Mathematical Statistics, 3rd ed. New York, John Wiley and Sons, 1975.

b. Hoel, Paul G. Introduction to Mathematics Statistics, 4th ed. New York, John Wiley and Sons, 1971.

c. Hoel, Paul G.; Port, Sidney C.; Stone, Charles, J. Introduction to Statistical Theory. Boston, Houghton Mifflin Company, 1971.

d. Hogg, Robert V. and Craig, Allen T. Introduction to Mathematical Statistics, 3rd ed. New York, Macmillan Publishing Company, 1970.

e. Kempthorne, Oscar and Folks, Leroy. Probability, Statistics, and Data Analysis. Ames, IA, Iowa State University Press, 1971.

f. Larson, Harold J. Introduction to Probability Theory and Statistical Inference, 2nd ed. New York, John Wiley Sons, 1974.

g. Meyer, Paul L. Introductory Probability and Statistical Applications, 2nd ed. Reading, MA, Addison-Wesley Publishing Company, 1970.

h. Mood, A. M.; Graybill, F. A.; Boes, D. C. Introduction to the Theory of Statistics, 3rd ed. New York, McGraw-Hill Book Company, 1974.

L3.2 (At least one of the following)

a. Cochran, W. G. and Cox, G. M. Experimental Designs, 2nd ed. New York, John Wiley and Sons, 1957.

b. Johnson, N. L. and Leone, F. C. Statistics and Experimental Design in Engineering and the Physical Sciences, vols, I, II. New York, John Wiley and Sons, 1964.

c. Walpole, Ronald E. and Myers, Raymond H. Probability and Statistics for Engineers and Scientists. New York, Macmillan Publishing Company, 1972.

d. Wine, R. L. Statistics for Scientists and Engineers. Englewood Cliffs, NJ, Prentice-Hall, 1964.

L3.3 (At least one of the following)

a. Box, George E. P. and Tiao, George C. Bayesian Inference in Statistical Analysis. Reading, MA Addison-Wesley Publishing Company, 1973.

b. LaValle, Irving H. An Introduction to Probability, Decision, and Inference. New York, Holt, Rinehart and Winston, 1970.

L3.4 (At least one of the following)

a. Bradley, James V. Distribution-Free Statistical Tests. Englewood Cliffs, NJ, Prentice-Hall, 1968.

b. Gibbons, Jean Dickinson. Nonparametric Statistical Inference. New York, McGraw-Hill Book Company, 1971.

c. Hajek, Jaroslav. A Course in Non-Parametric Statistics. San Francisco, Holden-Day, 1969.

d. Hollander, Myles and Wolfe, Douglas A. Nonparametric Statistical Methods. New York, John Wiley and Sons, 1973.

L3.5 (At least one of the following)

a. Bolch, Ben W. and Huang, Cliff J. Multivariate Statistical Methods for Business and Economics. Englewood Cliffs, NJ, Prentice-Hall, 1974.

b. Namboodiri, N. Krishnan; Carter, Lewis F.; Blalock, Hubert M., Jr. Applied Multivariate Analysis and Experimental Design. New York, McGraw-Hill Book Company, 1975.

c. Tatsouoka, Maurice M. Multivariate Analysis - Techniques for Educational and Psychological Research. New York, John Wiley and Sons, 1971.

L3.6 (At least one of the following)

a. Graybill, Franklin A. An Introduction to Linear Statistical Models, vol. 1. New York, McGraw-Hill Book Company, 1961.

b. Press, S. James. Applied Multivariate Analysis. New York, Holt, Rinehart and Winston, 1972.

c. Scheffé, Henry. The Analysis of Variance. New York, John Wiley and Sons, 1959.

L4 Advanced

L4.1 (At least one of the following)

a. Ferguson, T. S. Mathematical Statistics - A Decision Theoretic Approach. New York, Academic Press, 1967.

b. Kendall, Maurice G. and Stuart, Alan. The Advanced Theory of Statistics, 3 vols. New York, Hafner Press, vol. 1, 3rd ed., 1969; vol. 2, 3rd ed., 1974; vol. 3, 2nd ed., 1973.

c. Roussas, George C. A First Course in Mathematical Statistics. Reading, MA, Addison-Wesley Publishing Company, 1973.

d. Zacks, S. The Theory of Statistical Inference. New York, John Wiley and Sons, 1971.

M. NUMERICAL ANALYSIS

M1 Introductory, Including Programming

M1.1 (At least one of the following)

a. Haggerty, G. B. Elementary Numerical Analysis with Programming. Boston, Allyn and Bacon, 1972. (Out of Print)

b. Kuo, S. S. Computer Applications of Numerical Methods. Reading, MA, Addison-Wesley Publishing Company, 1972.

c. Pennington, R. H. Introductory Computer Methods and Numerical Analysis, 2nd ed. New York, Macmillan Publishing Company, 1970.

M2 Elementary

M2.1 (At least one of the following)

a. Acton, F. S. Numerical Methods that Work. New York, Harper and Row Publishers, 1970.

b. Carnahan, Brice; Luther, H. A.; Wilkes, James O. Applied Numerical Methods. New York, John Wiley and Sons, 1969.

c. Shampine, Lawrence and Allen, Richard C. Numerical Computing: An Introduction. Philadelphia, W. B. Saunders Company, 1973.

M2.2 (At least one of the following)

a. Dorn, William S. and McCracken, Daniel D. Numerical Methods with FORTRAN IV Case Studies. New York, John Wiley and Sons, 1972.

b. Hamming, R. W. Numerical Methods for Scientists and Engineers, 2nd ed. New York, McGraw-Hill Book Company, 1973.

M3 Intermediate

M3.1 (At least one of the following)

a. Bjorck, Ake and Dahlquist, Germund. Numerical Methods. Englewood Cliffs, NJ, Prentice-Hall, 1974.

b. Conte, Samuel and DeBoor, Carl W. Elementary Numerical Analysis: An Algorithmic Approach, 2nd ed. New York, McGraw-Hill Book Company, 1972.

c. Phillips, J. M. and Taylor, P. J. Theory and Applications of Numerical Analysis. New York, Academic Press, 1974.

d. Young, David and Gregory, Robert T. A Survey of Numerical Mathematics, 2 vols. Reading, MA, Addison-Wesley Publishing Company, 1972; 1973.

M4 Advanced

M4.1 (At least one of the following)

a. Isaacson, Eugene and Keller, H. B. Analysis of Numerical Methods. New York, John Wiley and Sons, 1966.

b. Ortega, James. Numerical Analysis: A Second Course. New York, Academic Press, 1972.

c. Wendroff, Burton. Theoretical Numerical Analysis. New York, Academic Press, 1966.

M5 Computations in Linear Algebra

M5.1 Stewart, G. W. Introduction to Matrix Computation. New York, Academic Press, 1973.

M5.2 (At least one of the following)

a. Forsythe, George E. and Moler, C. Computer Solution of Linear Algebraic Systems. Englewood Cliffs, NJ, Prentice-Hall, 1967.

b. Wilkinson, James H. The Algebraic Eigenvalue Problem. New York, Oxford University Press, 1965.

c. Young, David M. Iterative Solution of Large Linear Systems. New York, Academic Press, 1971.

M6 Computations for Differential Equations

M6.1 (At least one of the following)

a. Ames, William F. Numerical Methods for Partial Differential Equations. New York, Barnes and Noble, 1971.

b. Daniel, James W. and Moore, Ramon E. Computation and Theory in Ordinary Differential Equations. San Francisco, W. H. Freeman and Company, 1970.

c. Henrici, P. Discrete Variable Methods in Ordinary Differential Equations. New York, John Wiley and Sons, 1962.

d. Keller, H. B. Numerical Methods for Two-Point Boundary-Value Problems. New York, John Wiley and Sons, 1968.

e. Prenter, P. M. Splines and Variational Methods. New York, John Wiley and Sons, 1975.

M7 Approximation

M7.1 (At least one of the following)

a. Cheney, Elliott W. Introduction to Approximation Theory. New York, McGraw-Hill Book Company, 1966.

b. Davis, Philip J. Interpolation and Approximation. New York, Dover Publications, 1975.

N. COMPUTATION

The following list is for the computer science portion of a mathematics library. Books which are closely related to such disciplines as electrical engineering or psychology have not been included. Also, books oriented towards particular programming languages or machines have not been included, but manuals appropriate to the local installations should be available.

N1 General

N1.1 Knuth, D. The Art of Computer Programming, 3 vols. Reading, MA, Addison-Wesley Publishing Company, vol. 1, 2nd ed., 1974; vol. 2, 1969; vol. 3, 1973.

N1.2 Aho, A. V.; Hopcroft, J. E.; Ullman, J. D. Design and Analysis of Computer Algorithms. Reading, MA, Addison-Wesley Publishing Company, 1974.

N2 History

N2.1 (At least one of the following)

a. Goldstine, H. The Computer from Pascal to Von Neumann. Princeton, NJ, Princeton University Press, 1972.

b. Randell, Brian. The Origins of Digital Computers, Selected Papers. New York, Springer-Verlag New York, 1973.

N3 Computers and Society

N3.1 (At least one of the following)

a. Dorf, R. C. Computers and Man. San Francisco, Boyd and Fraser Publishing Company, 1974.

b. Gotlieb, C. C. and Borodin, A. Social Issues in Computing. New York, Academic Press, 1973.

c. Martin, J. and Norman, A. The Computerized Society. Englewood Cliffs, NJ, Prentice-Hall, 1970.

d. Rothman, S. and Mosmann, C. Computers and Society. Palo Alto, CA, Science Research Associates, 1972.

N4 Introductory

N4.1 (At least one of the following)

a. Dorf, R. C. Introduction to Computers and Computer Science. San Francisco, Boyd and Fraser Publishing Company, 1972.

b. Gear, C. W. Introduction to Computer Science. Palo Alto, CA, Science Research Associates, 1973.

c. Ralston, A. Introduction to Programming and Computer Science. New York, McGraw-Hill Book Company, 1971.

N5 Programming Languages

N5.1 (At least one of the following)

a. Elson, M. Concepts of Programming Languages. Palo Alto, CA, Science Research Associates, 1973.

b. Heaps, H. S. An Introduction to Computer Languages. Englewood Cliffs, NJ, Prentice-Hall, 1972.

c. Pratt, Terrence. Programming Languages: Design and Implementation. Englewood Cliffs, NJ, Prentice-Hall, 1975.

d. Sammet, J. Programming Languages: History and Fundamentals. Englewood Cliffs, NJ, Prentice-Hall, 1969.

N6 Data Structures

N6.1 (At least one of the following)

a. Berztiss, A. T. Data Structures: Theory and Practice, 2nd ed. New York, Academic Press, 1975.

b. Harrison, M. C. Data Structures and Programming. Glenview, IL, Scott, Foresman and Company, 1973.

c. Stone, H. S. and Siewiorek, D. P. Introduction to Computer Organization and Data Structures, PDP-11 ed. New York, McGraw-Hill Book Company, 1975.

N7 Mathematical Structures

N7.1 (At least one of the following)

a. Bobrow, Leonard S. and Arbib, Michael A. Discrete Mathematics: Applied Algebra for Computer and Information Science. Philadelphia, W. B. Saunders Company, 1974.

b. Korfhage, R. R. Discrete Computational Structures. New York, Academic Press, 1974.

c. Stone, H. S. Discrete Mathematical Structures and Their Applications. Palo Alto, CA, Science Research Associates, 1973.

N8 Graphs and Combinatorics

N8.1 (At least one of the following)

a. Bellman, Richard E.; Cooke, Kenneth; Lockett, Jo Ann. Algorithms, Graphs and Computers. New York, Academic Press, 1970.

b. Deo, N. Graph Theory with Applications to Engineering and Computer Science. Englewood Cliffs, NJ, Prentice-Hall, 1974.

c. Read, Ronald C., ed. Graph Theory and Computing. New York, Academic Press, 1972.

d. Wells, M. B. Elements of Combinatorial Computing. Elmsford, NY, Pergamon Press, 1971.

N9 Applications to Statistics

N9.1 (At least one of the following)

a. Cooley, William W. and Lohnes, Paul R. Multivariate Data Analysis. New York, John Wiley and Sons, 1971.

b. Hemmerle, William. Statistical Computations on a Digital Computer. New York, Blaisdell Publishing Company, 1967. (Out of Print)

c. Sterling, Theodor D. and Pollack, Seymour. Introduction to Statistical Data Processing. Englewood Cliffs, NJ, Prentice-Hall, 1968. (Out of Print)

N10 Applications to Mathematics

N10.1 Nievergelt, Jurg, et al. Computer Approaches to Mathematical Problems. Englewood Cliffs, NJ, Prentice-Hall, 1974.

N10.2 Smith, Jon M. Scientific Analysis on the Pocket Calculator. New York, John Wiley and Sons, 1975.

N11 Systems Programming

N11.1 (At least one of the following)

a. Coffman, E. G. and Denning, P. J. Operating System Theory. Englewood Cliffs, NJ, Prentice-Hall, 1973.

b. Freeman, Peter. Software Systems Principles, A Survey. Palo Alto CA, Science Research Associates, 1975.

c. Gear, C. W. Computer Organization and Programming, 2nd ed. New York, McGraw-Hill Book Company, 1974.

d. Hansen, P. B. Operating Systems Principles. Englewood Cliffs, NJ, Prentice-Hall, 1973.

e. Madnick, S. E. and Donovan, J. Operating Systems. New York, McGraw-Hill Book Company, 1974.

N12 Computer Architecture

N12.1 (At least one of the following)

a. Abrams, M. D. and Stein, S. G. Computer Hardware and Software. Reading, MA, Addison-Wesley Publishing Company, 1973.

b. Bell, C. G. and Newall, A. Computer Structures, Readings and Examples. New York, McGraw-Hill Book Company, 1971.

c. Burrough's Corporation. Digital Computer Principles, 2nd ed. New York, McGraw-Hill Book Company, 1969.

N13 Computer Arithmetic

N13.1 Stein, Marvin L. and Munro, William D. Introduction to Machine Arithmetic. Reading, MA, Addison-Wesley Publishing Company, 1971.

N14 Programming Style

N14.1 (At least one of the following)

a. Dahl, O. J.; Dijkstra, W.; Hoare, C. A. R. Structured Programming. New York, Academic Press, 1972.

b. Kernighan, B. J. and Plauger, P. J. The Elements of Programming Style. New York, McGraw-Hill Book Company, 1974.

c. Wirth, Niklaus. Systematic Programming: An Introduction. Englewood Cliffs, NJ, Prentice-Hall, 1973.

N15 Compilation

N15.1 (At least one of the following)

a. Abramson, Harvey. Theory and Application of a Bottom-up Syntax-Directed Translator. New York, Academic Press, 1973.

b. Foster, J. M. Automatic Syntactic Analysis. New York, American Elsevier Publishing Company, 1970

c. Halsted, M. H. A Laboratory Manual for Compiler and Operating System Implementation. New York, American Elsevier Publishing Company, 1974.

d. Lee, John A. N. The Anatomy of a Compiler, 2nd ed. New York, Van Nostrand Reinhold Company, 1974.

e. Weingarten, Frederick W. Translation of Computer Languages. San Francisco, Holden-Day, 1973.

N16 Formal Languages and Automata

N16.1 Hopcroft, John E. and Ullman, Jeffrey D. Formal Languages and their Relation to Automata. Reading, MA, Addison-Wesley Publishing Company, 1969.

N16.2 (At least one of the following)

a. Engeler, Erwin. Introduction to the Theory of Computation. New York, Academic Press, 1973.

b. Jones, Neil. Computability Theory. New York, Academic Press, 1973.

c. Kain, Richard Y. Automata Theory: Machines and Languages. New York, McGraw-Hill Book Company, 1972.

d. Minsky, Marvin. Computation: Finite and Infinite Machines. Englewood Cliffs, NJ, Prentice-Hall, 1967.

N17 Artificial Intelligence

N17.1 (At least one of the following)

a. Dreyfus, Hubert L. What Computers Can't Do. New York, Harper and Row Publishers, 1972.

b. Hunt, Earl B. Artificial Intelligence. New York, Academic Press, 1975.

c. Jackson, P. C. Introduction to Artificial Intelligence. New York, Petrocelli Books, 1974.

d. Nilsson, N. J. Problem Solving in Artificial Intelligence. New York, McGraw-Hill Book Company, 1971.

e. Schank, Roger C. and Colby, Kenneth Mark. Computer Models of Thought and Language. San Francisco, W. H. Freeman and Company, 1973.

f. Winston, P. H., ed. The Psychology of Computer Vision. New York, McGraw-Hill Book Company, 1975.

0. APPLICATIONS
See also P

01 General

01.1 Taub, A. H., ed. Studies in Applied Mathematics. MAA Studies in Mathematics, vol. 7. Washington, DC, Mathematical Association of America, 1971.

01.2 Proceedings: Summer Conference for College Teachers in Applied Mathematics. Hayward, CA, Committee on the Undergraduate Program in Mathematics, 1973.

01.3 (At least one of the following)

a. Lin, C. C. and Segel, L. A. Mathematics Applied to Deterministic Problems in the Natural Sciences. New York, Macmillan Publishing Company, 1974.

b. Maki, Daniel P. and Thompson, Maynard. Mathematical Models and Applications with Emphasis on the Social, Life, and Management Sciences. Englewood Cliffs, NJ, Prentice-Hall, 1973.

02 Physical Sciences, General (including Methods of Mathematical Physics)

02.1 Pollard, Harry. Introduction to Applied Mathematics. Reading, MA, Addison-Wesley Publishing Company, 1972.

02.2 Choquet-Bruhat, Y., Problems and Solutions in Mathematical Physics. San Francisco, Holden-Day, 1967.

02.3 (At least two of the following)

a. Boas, Mary L. Mathematical Methods in the Physical Sciences. New York, John Wiley and Sons, 1966.

b. Courant, R. and Hilbert, D. Methods of Mathematical Physics, 2 vols. New York, John Wiley and Sons, 1974.

c. Jeffreys, Sir Harold and Jeffreys, Bertha Swirles. Methods of Mathematical Physics, 3rd ed. New York, Cambridge University Press, 1956.

d. Mathews, Jon and Walker, Robert. Mathematical Methods of Physics. Reading, MA, W. A. Benjamin, 1970.

02.4 (At least one of the following)

a. Friedman, Bernard. Principles and Techniques of Applied Mathematics. New York, John Wiley and Sons, 1956.

b. Schwartz, L. Mathematics for the Physical Sciences. Reading, MA, Addison-Wesley Publishing Company, 1966.

c. Stakgold, Ivar. Boundary Value Problems in Mathematical Physics, 2 vols. New York, Macmillan Publishing Company, 1968. (2nd vol. Out of Print)

02.5 Friedman, Bernard. Lectures on Applications-Oriented Mathematics. San Francisco, Holden-Day, 1969.

02.6 (At least one of the following)

a. Lichnerowicz, André. Linear Algebra and Analysis, trans. by Alison Johnson. San Francisco, Holden-Day, 1968.

b. Sokolnikoff, Ivan. Tensor Analysis, Theory and Applications to Geometry and Mechanics of Continua, 2nd ed. New York, John Wiley and Sons, 1964.

03 Specific Areas in the Physical Sciences

03.1 (At least one of the following)

a. Goldstein, Herbert. Classical Mechanics. Reading, MA, Addison-Wesley Publishing Company, 1950.

b. Lanczos, Cornelius. Variational Principles of Mechanics, 4th ed. Buffalo, NY, University of Toronto Press, 1970.

03.2 (At least one of the following)

a. Brouwer, Dirk and Clemence, Gerald M. Methods of Celestial Mechanics. New York, Academic Press, 1961.

b. Pollard, Harry. Mathematical Introduction to Celestial Mechanics. Englewood Cliffs, NJ, Prentice-Hall, 1966. (To be issued as MAA Carus Monograph No. 18, 1977.)

03.3 (At least one of the following)

a. Batchelor, George K. Introduction to Fluid Dynamics. New York, Cambridge University Press, 1967.

b. Lamb, Sir Horace. Hydrodynamics, 6th rev. ed. New York, Dover Publications, 1956. (Reprint)

03.4 (At least one of the following)

a. Love, A. E. H. Treatise on the Mathematical Theory of Elasticity, 4th rev. ed. New York, Dover Publications, 1956. (Reprint)

b. Misner, Charles W.; Thorne, Kip S.; Wheeler, John Archibald. Gravitation. San Francisco, W. H. Freeman and Company, 1973.

c. Müller, C. Foundations of the Mathematical Theory of Electromagnetic Waves. New York, Springer-Verlag New York, 1969.

d. Rayleigh, Lord John. Theory of Sound, 2nd rev. ed., 2 vols. Gloucester, MA, Peter Smith Publisher, 1955.

e. Romanova, M. A. and Sarmanov, O. V., eds. Topics in Mathematical Geology, trans. by J. P. Fitzsimmons. New York, Plenum Publishing Corporation, 1970.

04 Engineering and Technology

04.1 Noble, Ben. Applications of Undergraduate Mathematics in Engineering. Washington, DC, Mathematical Association of America, 1967.

04.2 Zadeh, Lotfi and Desoer, C. A. Linear Systems Theory. New York, McGraw-Hill Book Company, 1963.

04.3 (At least one of the following)

a. Kreyszig, Erwin. Advanced Engineering Mathematics, 3rd ed. New York, John Wiley and Sons, 1972.

b. Sokolnikoff, Ivan S. and Redheffer, R. M. Mathematics of Physics and Modern Engineering, 2nd ed. New York, McGraw-Hill Book Company, 1966.

c. Wylie, C. R. Advanced Engineering Mathematics, 3rd ed. New York, McGraw-Hill Book Company, 1966.

05 Social Sciences, General

05.1 Messick, David M., ed. Mathematical Thinking in Behavioral Sciences. Readings from the Scientific American. San Francisco, W. H. Freeman and Company, 1968.

05.2 Kemeny, John G. and Snell, J. Laurie. Mathematical Models in the Social Sciences. Cambridge, MA, MIT Press, 1972.

05.3 Lazarsfeld, Paul F., ed. Mathematical Thinking in the Social Sciences. New York, Russell and Russell, 1969.

06 Economics

06.1 (At least two of the following)

a. Allen, R. G. D. Mathematical Economics, 2nd ed. New York, St. Martin's Press, 1959.

b. Arrow, Kenneth J., ed. Selected Readings in Economic Theory from Econometrica. Cambridge, MA, MIT Press, 1971.

c. Baumol, W. J. Economic Theory and Operations Analysis, 3rd ed. Englewood Cliffs, NJ, Prentice-Hall, 1972.

d. Henderson, James M. and Quandt, Richard E. Microeconomic Theory: A Mathematical Approach, 2nd ed. New York, McGraw-Hill Book Company, 1971.

e. Intriligator, M. D. Mathematical Optimization and Economic Theory. Englewood Cliffs, NJ, Prentice-Hall, 1971.

07 Sociology, Anthropology, and Linguistics

07.1 (Any three of the following)

a. Beauchamp, Murray A. Elements of Mathematical Sociology. Philadelphia, Philadelphia Book Company, 1970.

b. Berger, Joseph, et al. Types of Formalization in Small Group Research. Boston, Houghton Mifflin Company, 1962.

c. Coleman, James S. Introduction to Mathematical Sociology. New York, Free Press, 1964.

d. Fishburn, Peter C. The Theory of Social Choice. Princeton, NJ, Princeton University Press, 1973.

e. Gross, Maurice. Mathematical Models in Linguistics. Englewood Cliffs, NJ, Prentice-Hall, 1972.

f. Levison, Michael, et al. The Settlement of Polynesia: A Computer Simulation. Minneapolis, University of Minnesota Press, 1973.

08 Psychology

08.1 Atkinson, Richard C., et al. Introduction to the Mathematical Learning Theory. Huntington, NY, Robert E. Krieger Publishing Company, 1965.

08.2 Luce, Robert D., et al. Handbook of Mathematical Psychology, 3 vols. New York, John Wiley and Sons, 1963-1965.

08.3 Tversky, Amos; Coombs, Clyde H.; Dawes, Robyn M. Mathematical Psychology, An Elementary Introduction. Englewood Cliffs, NJ, Prentice-Hall, 1970.

09 Political Science

09.1 (At least one of the following)

a. Alker, Hayward R., Jr. Mathematics and Politics. New York, Macmillan Publishing Company, 1965.

b. Saaty, Thomas L. Mathematical Models of Arms Control and Disarmament. Huntington, NY, Robert E. Krieger Publishing Company, 1968.

c. Tullock, Gordon. Toward a Mathematics of Politics. Ann Arbor, MI, University of Michigan Press, 1967.

010 Biology, General

010.1 Smith, J. Maynard. Mathematical Ideas in Biology. New York, Cambridge University Press, 1968.

010.2 (At least one of the following)

a. Batschelet, Edward. Introduction to Mathematics for Life Scientists, 2nd ed. New York, Springer-Verlag New York, 1976.

b. Clow, D. and Urquhart, N. Mathematics in Biology: Calculus and Related Topics. New York, W. W. Norton and Company, 1974.

c. Grossman, Stanley and Turner, James E. Mathematics for the Biological Sciences. New York, Macmillan Publishing Company, 1974.

010.3 Rosen, Robert, ed. Foundations of Mathematical Biology, New York, Academic Press, 1972-1973.

011 Genetics and Evolution

011.1 (At least one of the following)

a. Crow, James F. and Kimura, Moto. An Introduction to Population Genetics Theory. New York, Harper and Row Publishers, 1970.

b. Kempthorne, Oscar. An Introduction to Genetic Statistics. Ames, IA, Iowa State University Press, 1957.

c. Leigh, Egbert Giles. Adaptation and Diversity: Natural History and the Mathematics of Evolution. San Francisco, Freeman, Cooper and Company, 1971.

012 Population and Ecology

012.1 (At least one of the following)

a. Keyfitz, Nathan. Introduction to the Mathematics of Population. Reading, MA, Addison-Wesley Publishing Company, 1968.

b. Pollard, J. H. Mathematical Models for the Growth of Human Populations. New York, Cambridge University Press, 1973.

c. Wilson, Edward O. and Bossert, William H. A Primer of Population Biology. Sunderland, MA, Sinauer Associates, 1971.

012.2 (At least one of the following)

a. Pielou, E. C. An Introduction to Mathematical Ecology. New York, John Wiley and Sons, 1969.

b. Watt, Kenneth E. F. Ecology and Resource Management: A Quantitative Approach. New York, McGraw-Hill Book Company, 1967.

013 Information Theory

013.1 (At least one of the following)

a. Ash, R. B. Information Theory. New York, John Wiley and Sons, 1965.

b. Khinchin, A. I. Mathematical Foundations of Information Theory. New York, Dover Publications, 1957.

013.2 Shannon, Claude E. and Weaver, W. The Mathematical Theory of Communication. Urbana, IL, University of Illinois Press, 1949.

P. MATHEMATICAL PROGRAMMING
See also C1, 06

P1 General

P1.1 Dantzig, George. Linear Programming and Extensions. Princeton, NJ, Princeton University Press, 1963.

P1.2 Gale, David. The Theory of Linear Economic Models. New York, McGraw-Hill Book Company, 1960.

P1.3 (At least one of the following)

a. Gaver, Donald P. and Thompson, Gerald L. Programming and Probability Models in Operations Research. Monterey, CA, Brooks/Cole Publishing Company, 1973.

b. Hillier, Frederick S. and Lieberman, Gerald J. Introduction to Operations Research, 2nd ed. San Francisco, Holden-Day, 1974.

c. Sasieni, Maurice W.; Yaspan, A.; Friedman, L. Operations Research: Methods and Problems. New York, John Wiley and Sons, 1959.

d. Wagner, Harvey M. Principles of Operations Research with Applications to Managerial Decisions. Englewood Cliffs, NJ, Prentice-Hall, 1969.

P1.4 Singleton, Robert R. and Tyndall, William F. Games and Programs: Mathematics for Modeling. San Francisco, W. H. Freeman and Company, 1974.

P2 Game Theory

P2.1 (At least one of the following)

a. Davis, Morton D. Game Theory. A Nontechnical Introduction. New York, Basic Books, 1970.

b. Williams, John Davis. The Compleat Strategyst, rev. ed. New York, McGraw-Hill Book Company, 1965.

P2.2 Owen, Guillermo. Game Theory. Philadelphia, W. B. Saunders Company, 1968.

P2.3 Luce, Robert Duncan and Raiffa, Howard. Games and Decisions. New York, John Wiley and Sons, 1957.

P3 Linear Programming

There are many elementary texts in linear programming; every library should have one or two.

P3.1 Strum, Jay E. Introduction to Linear Programming. San Francisco, Holden-Day, 1972.

P3.2 Spivey, W. Allen and Thrall, Robert M. Linear Optimization. New York, Holt, Rinehart and Winston, 1970.

P3.3 (At least one of the following)

a. Gass, Saul I. Linear Programming, 3rd ed. New York, McGraw-Hill Book Company, 1969.

b. Hadley, George. Linear Programming. Reading, MA, Addison-Wesley Publishing Company, 1962.

P4 Dynamic Programming

P4.1 Bellman, Richard E. and Dreyfus, Stuart E. Applied Dynamic Programming. Princeton, NJ, Princeton University Press, 1962.

P5 Networks and Integer Programming

P5.1 (At least one of the following)

a. Ford, L. R., Jr. and Fulkerson, D. R. Flows in Networks. Princeton, NJ, Princeton University Press, 1962.

b. Garfinkel, R. S. and Nemhauser, G. L. Integer Programming. New York, John Wiley and Sons, 1972.

c. Hu, T. C. Integer Programming and Network Flows. Reading, MA, Addison-Wesley Publishing Company, 1969.

P6 Nonlinear Programming

P6.1 Mangasarian, O. L. Nonlinear Programming. New York, McGraw-Hill Book Company, 1969.

P6.2 Murray, W., ed. Numerical Methods for Unconstrained Optimization. New York; Academic Press, 1972.

P6.3 Gill, P. E. and Murray, W., eds. Numerical Methods for Constrained Optimization. New York, Academic Press, 1974.

V. JOURNALS

A. Journals that should be included in every undergraduate library.

The American Mathematical Monthly. Mathematical Association of America, 1225 Connecticut Avenue, N.W., Washington, DC 20036.

Journal of Recreational Mathematics. Baywood Publishing Company, 43 Central Drive, Farmingdale, NY 11735.

The Mathematical Gazette. The journal of the Mathematical Association, G. Bell and Sons, Ltd., London, W. C. 2, England.

Mathematics Magazine. Mathematical Association of America, 1225 Connecticut Avenue, N.W., Washington, DC 20036.

The Mathematics Teacher. National Council of Teachers of Mathematics, 1906 Association Drive, Reston, VA 22091.

SIAM Review. Society for Industrial and Applied Mathematics, 33 South 17th Street, Philadelphia, PA, 19103.

The Two Year College Mathematics Journal. Mathematical Association of America, 1225 Connecticut Avenue, N.W., Washington, DC 20036.

B. Journals that are optional for undergraduate libraries.

The American Statistician. American Statistical Association, 806 15th Street, N.W., Washington, DC 20005.

The Fibonacci Quarterly. The Fibonacci Association, St. Mary's College, CA 94575.

Historica Mathematica. University of Toronto, Toronto, Ontario, Canada M5S 1A1.

International Journal of Mathematical Education in Science and Technology. John Wiley and Sons, Ltd., Baffins Lane, Chichester, Sussex, England.

Journal for Research in Mathematics Education. National Council of Teachers of Mathematics, 1906 Association Drive, Reston, VA 22091.

Journal of the American Statistical Association. American Statistical Association, 806 15th Street, N.W., Washington, DC 20005.

Journal of Undergraduate Mathematics. Guilford College, Greensboro, NC 27410.

Mathematical Reviews. American Mathematical Society, Box 6248, Providence, RI, 02904.

The Mathematical Spectrum. Department of Probability and Statistics, The University, Sheffield S3 7RH England.

The Pi Mu Epsilon Journal. National Mathematics Fraternity, University of Oklahoma, Norman, OK, 73069.

W. SERIES

Series of excellent inexpensive books exist, whose inclusion in a library for undergraduates is suggested. Individual volumes in some of the following series are included in the basic list. In general, the following series are recommended, although, of course, individual volumes vary in quality and no endorsement of future volumes in any series is implied.

The Carus Mathematical Monographs. Washington, DC, Mathematical Association of America. Expository books for teachers and students.

Dolciani Mathematical Expositions. Washington, DC, Mathematical Association of America.

MAA Studies in Mathematics. Washington, DC, Mathematical Association of America. Collections of expository articles on recent developments in particular areas of mathematics.

NCTM Yearbooks. Reston, VA, National Council of Teachers of Mathematics. Resource books for elementary and secondary school teachers.

New Mathematical Library. Washington, DC, Mathematical Association of America. This series is highly regarded for both classroom use and independent study by students.

Popular Lectures in Mathematics. Chicago, University of Chicago Press. Intended to introduce various aspects of mathematical thought and engage the student in creative activity. Translated from the Russian.

Scientific American Book of Mathematical Puzzles and Diversions and subsequent volumes. Martin Gardner, ed. New York, Simon and Schuster.

Studies in Mathematics. School Mathematics Study Group. Pasadena, CA, A. C. Vroman. Resource material for school teachers.

Topics in Mathematics. Lexington, MA, D. C. Heath and Company. Translated from the Russian series "Popular Lectures in Mathematics."

Translations from the Russian. Lexington, MA, D. C. Heath and Company. Survey of Recent East European Mathematical Literature, A. L. Putnam and I. Wirszup, project directors.

X. FILMS

A comprehensive list of films (and other audio-visual aids) available in the United States is:

Audiovisual Materials in Mathematics
by J. A. Raab. National Council of
Teachers of Mathematics, 1971.

Two major distributors of mathematics films are:

Modern Film Rentals
2323 New Hyde Park Road
New Hyde Park, NY 11040

International Film Bureau
332 South Michigan Avenue
Chicago, IL 60604

Modern Film Rentals handles MAA films. International Film Bureau carries geometry films (Seymour Schuster) and topology films (Nelson Max).

Films are also available for rental from some book publishers.

Y. BOOKS IN FOREIGN LANGUAGES

As a matter of policy, publications in foreign languages have not been included in the preceding sections of this list. Nevertheless, we recommend that some books in foreign languages--especially Russian, French, and German--be included in the collection. The principal purpose of these books would be to provide the student with an opportunity to learn to read mathematics in the languages, not to add to the mathematical coverage of the library.

In some cases both the foreign language original and an English translation might be provided; for this purpose the originals of works, translations of which have already been recommended, would be natural choices. In other cases one might choose books of which English translations do not exist. Either way, books whose content is relatively light or is likely to be at least partially familiar to the student should be given special consideration.

AAKER, David A. Multivariate Analysis in Marketing: Theory and Application. L2.5a

ABRAMS, M. D. and STEIN, S. G. Computer Hardware and Software. N12.1a

ABRAMSON, Harvey. Theory and Application of a Bottom-up Syntax-Directed Translator. N15.1a

ACTON, F. S. Numerical Methods that Work. M2.1a

AHLFORS, Lars V. Complex Analysis. H5.3a

AHO, A. V.; HOPCROFT, J. E.; ULLMAN, J. D. Design and Analysis of Computer Algorithms. N1.2

AICHELE, Douglas B. and REYS, Robert E., eds. Readings in Secondary School Mathematics. A5.7a

ALBERT, A. Adrian and SANDLER, Reuben. Introduction to Finite Projective Planes. I7.3a

ALDER, Henry and ROESSLER, Edward B. Introduction to Probability and Statistics. L2.1a

ALEKSANDROV, A. D.; KOLMOGOROV, A. N.; LAVRENT'EV, M. A., eds. Mathematics: Its Content, Methods, and Meaning. A1.1a

ALKER, Hayward R., Jr. Mathematics and Politics. O9.1a

ALLEN, R. G. D. Mathematical Economics. O6.1a

ALLEN, Richard C. - See Shampine M2.1c

AMES, William F. Numerical Methods for Partial Differential Equations. M6.1a

ANDERSON, Ian. A First Co[illegible]mbinatorial Mathematics. C2.3a

ANDERSON, John T. - See Ogilvy [illegible]

APOSTOL, Tom M. Calculus. G3.2a

_____, ed. Selected Papers on Calculus. G2.1

ARBIB, Michael A. - See Bobrow N7.1a

ARNOLD, V. I. Ordinary Differential Equations. H6.4

ARROW, Kenneth J., ed. Selected Readings in Economic Theory from Econometrica. O6.1b

ARTIN, Emil. Galois Theory. E4.1a

_____. Geometric Algebra. I10.3a

ARTZY, Rafael. Linear Geometry. I10.1a

ASH, R. B. Information Theory. O13.1a

_____. Real Analysis and Probability. K5.2a

ATIYAH, Michael and MAC DONALD, I. G. Introduction to Commutative Algebra. E3.1a

ATKINSON, Richard C., et al. Introduction to the Mathematical Learning Theory. O8.1

AVONDO-BODINO, G. Economic Applications of the Theory of Graphs. C3.5a

BACHMAN, George and NARICI, Lawrence. Functional Analysis. H11.3a

BAER, Reinhold. Linear Algebra and Projective Geometry. I10.2a

BALL, W. W. Rouse and COXETER, H. S. Mathematical Recreations and Essays. A2.1a

BAR-HILLEL, Yehoshra. - See Fraenkel B3.2a

BARNETT, Vic. Comparative Statistical Inference. L1.3

BARTHOLOMEW, D. J. Stochastic Models for Social Processes. K4.5a

BARTLE, Robert G. Elements of Real Analysis. G4.3a

BATCHELOR, George K. Introduction to Fluid Dynamics. O3.3a

BATSCHELET, Edward. Introduction to Mathematics for Life Scientists. O10.2a

BAUM, Robert J. Philosophy and Mathematics: From Plato to the Present. B1.4

BAUMOL, W. J. Economic Theory and Operations Analysis. O6.1c

BEALS, R. Advanced Mathematical Analysis. H4.4

BEAUCHAMP, Murray A. Elements of Mathematical Sociology. O7.1a

BECKENBACH, E. F., ed. Applied Combinatorial Mathematics. C2.5

_____ and BELLMAN, R. Inequalities. H3.1a

BEGLE, E. G., ed. The Role of Axiomatics and Problem Solving in Mathematics. A5.6a

BEHNKE, H., et al., eds. Fundamentals of Mathematics. A1.1b

BEHZAD, Mehdi and CHARTRAND, Gary. Introduction to the Theory of Graphs. C3.2

BELL, C. G. and NEWALL, A. Computer Structures, Readings and Examples. N12.1b

BELL, Eric T. Men of Mathematics. A4.1

BELLMAN, R. - See Beckenbach H3.1a

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